FORESTRY AND IRRIGATION

FRANK GLOVER HEATON, *Editor*

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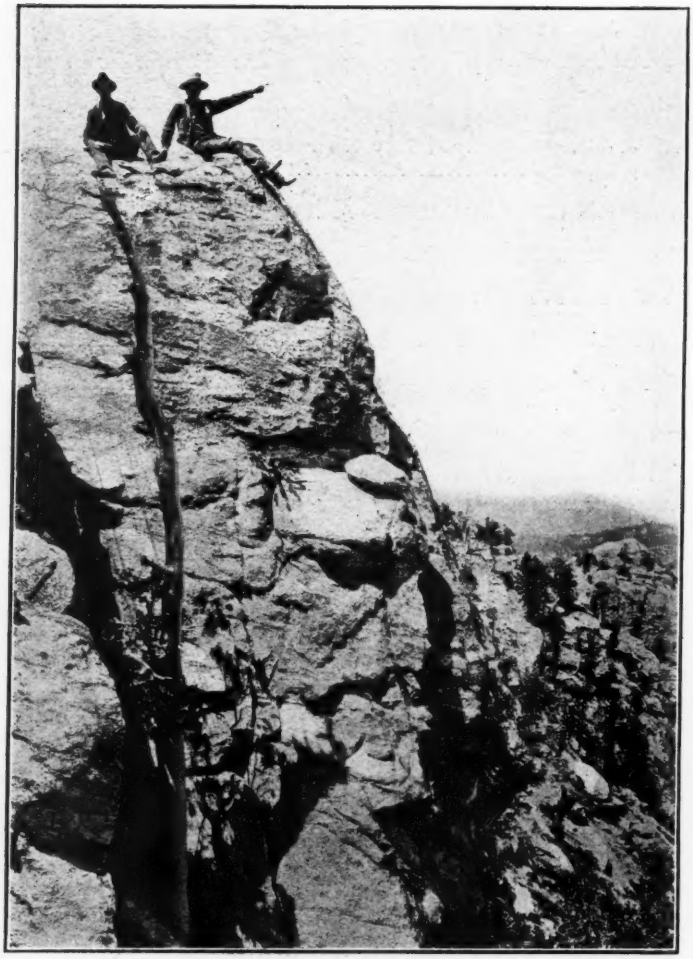

IN THE NEW CLEVELAND NATIONAL FOREST

Taggart Rock, the Summit of Tocquitz Peak, Old San Jacinto, N. F.

FORESTRY AND IRRIGATION

Vol. XIV AUGUST, 1908 No. 8

A PLEA FOR NATIONALIZATION OF OUR NATURAL RESOURCES

By HENRY RIESENBERG, Indianapolis, Ind.

THERE is growing apace in the world to-day a spirit of cooperation. Men are growing out of the old theory of individualism, which finds expression in such sentiments as "Every man for himself and the devil take the hindmost;" or "What's mine is my own to do with as I please."

At the recent Conference of Governors, held at the White House, it was graphically pointed out that the policy of individualism in regard to our natural resources has brought us almost to the brink of actual exhaustion; every student of the subject is at one in declaring that unless radical action be taken in regard to our forests, minerals, and waterways, the day will soon dawn which will see this country treeless, mineral-less, and waterless. Woe be unto us when that day arrives.

Admitting the hypothesis then—and who will gainsay it?—that our natural resources urgently require conservation, the question naturally arises, what steps ought we—the present possessors of these resources—to take in order best to conserve them, not only for ourselves, but for our children and our childrens' children?

Quite recently the writer, in a discussion of this topic, took occasion to point out that the several states of the Union and the United States itself, are the owners of natural resources of vast value. These consist of farm lands, arid lands, swamp lands, timber lands, mineral lands, waters, and waterways. As their complete utilization is fundamentally beneficial to the country as a whole, the writer urged the merger of these resources by the states with those of the United States, in order that a comprehensive, adequate, and uniform policy could be adopted for the reforestation of cut-over and burnt-over timber lands; for forestation to protect the headwaters of our streams; for the irrigation of arid lands; reclamation of swamp lands; improvement for purposes of irrigation of all worthy watercourses; for the creation and sale of electrical energy, and for the establishment of model coal, iron, and other

mineral mines, so that an object lesson to private enterprise might be furnished with a view of abrogating the present fearfully wasteful methods of production.

We know from experience that attempts at development on the part of the states as separate entities must be local, incomprehensive, and inadequate; these efforts must absolutely cease at the state boundary lines, although a full realization of results may be attained only by obliterating political divisions. It is quite clear, then, that our natural resources should be developed and conserved in a national way, and national development is possible only by a national agency whose policy it would be to realize for all the people, irrespective of locality, section, or state, the maximum of benefits at a minimum of expense.

Whilst most of us are believers in the theory of States' rights, and but few subscribe to the maxim that a strongly centralized government would be more beneficial for us yet all of us do believe in union, which, carried to its logical conclusion, is cooperation; and in considering a question so vital as the very life of the Nation what grander principle should be invoked than the one which expresses itself in the term cooperation.

President Roosevelt, in his address to the Governors at the White House, pointed out that even "Washington clearly saw that the perpetuity of the states could only be secured by union, and that the only feasible basis of union was an economic one; in other words, that it must be based on the development and use of their natural resources."

The President also pointed out that "whilst our natural resources are not gone, they have been so injured by neglect and by the division of responsibility and utter lack of system in dealing with them, that there is less navigation on our waterways now than there was fifty years ago." And, finally, "In the past we have admitted the right of the individual to injure the future of the Republic for his own profit. The time has come for a change. As a people, we have the right and the duty to protect ourselves and our children against the wasteful development of our natural resources, whether that waste is caused by the actual destruction of such resources or by making them impossible of development hereafter."

The Resolutions Committee of the White House Conference also stated in its report, made to the Convention, that "We declare the conviction that in the use of the natural resources our independent states are interdependent and bound together by ties of mutual benefits, responsibilities and duties."

The Inland Waterways Commission, in its preliminary report, voiced its conviction regarding the matter thus: "Means should be devised and applied for coordinating forestry, farming, mining, and related industries with the use of streams for commerce and for other purpose." Also, "questions concerning the control of water-power and waterways should be treated as a general question of national extent, while local or special projects should be considered as parts of a comprehensive policy of waterway control in the interests of all the people."

James J. Hill concluded his admirable address at the Governors' Conference by saying: "If this movement is to make headway * * * it needs the cooperation of all the influences, the help of every voice, the commendation of nation and state, and such cooperation as that out of which this nation was born, and by which it was reared to worthy manhood."

Andrew Carnegie, in his paper, likens "this Nation to a large family receiving a rich patrimony from thrifty parents deceased intestate * * * Now the first duty of such a family is to take stock of its patrimony; the next, to manage the assets in such manner that none shall be wasted, that all be put to the greatest good of the living and their descendants."

Prof. Emory R. Johnson, in his "Navigation Resources of American Waterways," says "There is only one

WORK IN A NATIONAL FOREST

Cutting Area, Showing Cordwood Cut from Tops and Limbs. Gila (S) National Forest

power whose authority is as wide as our country, and that is the Federal Government. In the future, but small place in the development and control of water-power and waterways will be given either to the state or to private corporations."

F. H. Newell Chief Engineer of the United States Reclamation Service, states, "The matter of the development of the West is not a state question. We must conserve forests in Wyoming to benefit the arid plains of Idaho. In western Kansas there is the greatest interest in irrigation, and although there are no forests, the rivers that come into Kansas, as the Arkansas, depend for the continuity of their flow on the proper treatment of the woodlands on the mountains in the central part of Colorado," and so forth, "ad infinitum."

The foregoing is sufficient to prove to the unbiased mind that a national agency is absolutely essential to carry on the work of conservation in this country. If we agree on this, the question naturally arises, what national agency is better qualified to take up and carry on the work than the National Government?

In view of this, then, I advocate that all national resources owned by the states as such should be merged with those owned by the United States; that the National Congress create a new department to be called the Department of National Resources and Public Works, whose head shall be a cabinet minister with the title of Director of National Resources and Public Works; that in this department shall be merged the Forestry Bureau, Mines and Minerals Bureau, Reclamation Service, Navigation Bureau, Geological Survey, etc. This department shall control the development of all natural resources, such as lands, forests, minerals, water-power, and the improvement of waterways; shall also direct such work as irrigation, forestation, reclamation of swamp

FURROW IRRIGATION

Ranchers at Work in the Pecos Valley, near Roswell, N. M.

lands and arid lands, clarification of streams and other similar enterprises. It shall also be empowered to purchase from corporations and private individuals lands for such purposes as above stated, and in addition shall have the power to invoke the law of eminent domain. It may also sell or lease lands, sell timber, sell or lease water-power, sell or lease electrical energy, sell coal and other minerals.

In order that all the states may cooperate fully, justly and equitably in such a plan I recommend that each and every state list its natural resources, the United States doing likewise; that the President of the United States appoint an Appraisal Commission, this commission to appraise at its true value all such resources, and, after such appraisal, the several states and the Federal Government as well, accept such appraisement, and that they severally be given credit for the amounts allotted to each by the commission.

I further recommend that the Department of National Resources and Public Works be administered by a commission, whose head shall be a Cabinet Minister appointed by the President of the United States, this commission to include the Governors of the states and territories of the Union, each of whom shall act as Commissioner from his state to serve during his term of office "ex officio," and without compensation other than the payment of expenses, for the administration of the above-named resources. It is also recommended that majority rule shall apply with this commission, the executive of which having the power only to carry out the mandates of the majority of said commission.

As large sums of money will be needed to carry forward the work of this department, the Congress shall, upon the recommendation of the commission, cause to be issued bonds against these natural resources, pro-

ceeds from such sales to be set aside for the exclusive use of this department.

As, in the course of time, a vast income will inure to this department from the sale and lease of lands, sale of timber, sale of coal and other minerals, sale and lease of water-power, and sale and lease of electrical energy, provision should be made not only to pay the interest on the bonds, but also, in the course of time, to retire them. In addition, I would recommend that all moneys derived from the above-stated sources, over and above that required for the interest and retirement of the bond issues and the maintenance of the several divisions of the department, be distributed annually or biennially to the several states and the Federal Government, paying to each a proper and pro rata share according to the appraised value of the natural resources turned in by each to the general plan.

The above, in brief, is my plan, and much as we may cavil at the radical recommendations made, which differ from our present plan of operation, there is no doubt but what, sooner or later, there will be a general clamor for its adoption. In no other way can we obtain a true business administration and our natural resources should be regarded, exploited, improved, and conserved on business lines solely. Heretofore, whenever improvements have been made, such as forestation, reforestation, reclamation of swamp lands and arid lands, improvement of waterways and harbors, the work has been carried on in a haphazard, disjointed and inconsistent manner, at an enormous expense to the people of this country, an expense disproportionate to the benefits derived; my plan provides for a unification of efforts, and, what is vastly more important, the expense will be paid for by the improvements made; for instance, streams can be so improved that millions of horse-power of electrical energy will be developed, which should be marketed in a businesslike way, as any other commodity is sold. Timber can be sold annually, reclaimed lands can be sold, grazing lands can be leased, coal can be sold, likewise other minerals, etc. Thus, our resources will be conserved without adding one dollar to the national expense account.

IRRIGATION IN THE NORTHWEST
Upstream Face of the Great "Pathfinder" Dam, in Wyoming

USE OF A NATIONAL FOREST
Cattle Grazing in Shepard Canyon, Gila (S) N. F.

It is almost certain, judging the future by the past, that the states cannot, and individuals and corporations will not, adopt a uniform plan for the conservation of our natural resources, a plan that will work the greatest good to the greatest number. The states cannot be expected to do the essential part of this work; it involves absolutely uniform national activity.

To those of my readers who may question the necessity for such an elaborate scheme as my plan involves, for the conservation of our national resources, I would say, there are many people in this country of ours to whom the question of States' rights is a bugaboo; who fear that the centralization of power in the hands of the Federal Government will tend to undermine our system of government. Whilst, personally, I have no fear that our government will ever decay or be disrupted by any system of control we are likely to adopt for its operation, yet, there are untold thousands who affect to believe that the placing of additional power in the hands of our Federal Government will tend to its destruction; so, my plan, whilst advocating a national agency, does not involve an absolute surrender by the states of their rights to Federal control; it simply provides a scheme for national cooperation—national partnership, if you will.

A feature that should be borne in mind in behalf of my plan is its absolute non-partisan control; under this plan, the entire matter is taken out of and lifted above mere politics, and we may expect a business administration of our resources such as we positively could not get in any other way.

The country's need is great and pressing; the remedy, therefore, must be adequate even if radical and advanced. To sum it all up, do the American people believe in actual union of the states for the benefit of all, or is union merely a platitude?

THE BRANDING OF THE FORESTS

By the "POET LARIAT"

(On July 1 many of the National Forests were given new names)

COME and listen to my story, all ye Forest Service men,
Once the Forester was sitting in his spacious, lofty den,
And he wiped his sweating forehead as he grabbed his stubby pen,
And he swore by all things sacred that he'd name 'em, there and then.

So he punched a handy button and the messengers they came,
Like a bunch of baseball rooters, when the umpire hollers "Game!"
And he sent this word to each one of his tried and trusty lads:
"This day we'll have a christening; come and make believe you're dads."

"Make 'em short, and make 'em simple," was the edict of the Chief.
"Chop 'em down to small dimensions, like a goat's tail—short and brief."
"No two deckers—no sky scrapers. One word only, nothing more."
And the workers murmured gently, whispered low—and softly swore.

So they gathered in that aerie where the Chieftain sits in state,
And they puzzled, and they foozled, and each scratched his aching pate.
And they cut 'em and they slashed 'em, and they changed those names about.
Oh, they placed them endways—sideways, and they turned them inside out.

They hunted through the legends of the heroes—young and old.
They delved into the records of explorers brave and bold.
They searched for names of Indians, and of patriots so great,
And they studied o'er the doings of the big men of the state.

So, after weeks of planning, and of scheming deep and dark,
That went back almost into the days of Noah's Ark.
They got those forests branded (sure they burned 'em good and deep).
And the christening was over—then the boys began to weep.

Quoth a "Super" from the Northwest, "'Tis indeed a bitter pill,
When these people on my forest ask me, 'Who was Bonneville?'"
To be forced to own up, honest, "You can search me—don't ask me,"
Mebbe he's from o'er the ocean, from the wilds of gay "Paree."

Oh, they took "Eklaka," "Long Pine," "Slim Buttes," and "Short Pine" too,
And they bunched them up with "Cave Hills," then they named the whole thing "Sioux."
And "Tillamook," and "Umpqua," (names that almost broke your jaw).
Why, they've hitched 'em up together under sibillant "Suislaw."

From the far Blue Mountain region came a query hushed and low:
"Which of the Whitmans is it? For I'm just obliged to know."
Here's a man who wants a permit for to pasture Baalam's ass,
But he swears he's 'feered to graze him upon Whitman's "Leaves of Grass."

Then from the peaks of Idaho there came a fearful yell.
You used to call it "Koo-ten-ai," but now 'tis "Pen d'Oreille."
"Hold on a bit—perhaps you're wrong," a ranger whispered slyly,
"'Tis Irish, sure—a good old name; they call it plain 'O'Reille'."

And so it goes all o'er the West, and even with the ladies,
This christening job has mixed things up and just raised merry Hades.
So take your time, and learn the list, or else you'll lose your standing.
And live to cuss the fatal day that saw this forest branding.

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Cattle Grazing in Shepard Canyon, Gila (S) N. F.

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RAILROAD FORESTRY WORK

How the Pennsylvania System Is Planning for a Permanent Timber Supply of Its Own

IN CONTINUANCE of its plans to provide for some of its future requirements in timber and cross-ties, the Pennsylvania Railroad Company has recently completed its spring forestry planting for this year. Including the permanent planting and the stocking of the nursery, there was handled this spring a total of 625,000 young trees. These make, up to the present time, 2,425,000 trees which have been set out by the Pennsylvania Railroad since it undertook tree-planting upon a scientific and comprehensive scale—this constituting the largest forestry plan undertaken as yet by any corporation.

About 460,000 of the seedlings put out this year were conifers, such as Scotch pine, white pine, and Norway spruce, and 168,000 were hardwoods, principally red oak. Nearly 75,000 of the total were grown or handled in the company nursery at Hollidaysburg. The seed sown comprised 250 bushels of acorns and nuts, 370 pounds of other hardwood seeds, and seventy-five pounds of conifer seeds. Three hundred thousand seedlings were permanently planted in land belonging to the company.

Economically to prosecute tree-planting operations on so large a scale necessitates at present the importation of part of the plant material, because European foresters, on account of the degree of perfection to which they have brought their work, and the cheapness of labor, are able to supply certain forest trees for less than they can be purchased at in America. This applies not only to native European species, such as Scotch pine and European larch, but also to our own trees, particularly white pine and Douglas fir.

The Pennsylvania Railroad this spring imported 209,000 seedlings, made up of 150,000 Scotch pine, 25,000 European larch, 25,000 Norway spruce, 5,000 white pine, and 1,000 each of Sequoia, Japanese larch, scarlet oak and Douglas fir. Some of these are not large enough to be planted in their permanent sites, and have been set out in transplant rows in the new forest nursery established this year by the company at Morrisville, Pa., just across the Delaware River from Trenton. Twelve acres have been carefully laid out there as seed beds, transplant beds, and nursery plots. Already the last-named contains 1,500 000 red-oak seedlings, which have come up from acorns put into the ground about April 1. In addition to the oaks, there are, in the nursery plots, thrifty seedlings growing up from five bushels of black walnut, ten bushels of chestnut, and 100 pounds of hickory nuts, which were sowed there. The seed beds have had sowed in them twenty-six pounds of Scotch pine, fourteen pounds of loblolly pine, five pounds of red pine, twenty pounds of European larch, 250 pounds of black locust, and smaller quantities of other seed, such as Norway spruce, yellow poplar, hardy catalpa, and basswood. Three hundred fifteen thousand little trees are in the transplant rows, where they will receive careful attention until large enough to be planted out in their final site.

The few trees mentioned above, which are not primarily suitable for timber production, are part of the stock in the nursery being grown for purposes of landscaping. The company has this year begun the propagation of ornamental trees and plants for beautifying its property, and intends to develop a large amount of shrubbery and hedges for the

WORK IN A NATIONAL FOREST
Lumbering Operations under Forest Service Rules—Young Timber Left Standing

protection and ornamentation of the station grounds and rights of way. This work will be continued until all station grounds and unoccupied spaces on the right of way are parked, that they may afford as much pleasure as possible to the public. Besides reforesting old farmland and other open areas as in the past, the field planting this year has restocked certain areas which were logged during 1907, and has underplanted certain old locust plantations which needed interspersed trees to stimulate their growth in height and to regulate their form development.

In addition, it is believed that the conservative lumbering and the forest planting, which the company is conducting on its woodlots and farmlands, which are not now needed for other purposes, will serve as an object-lesson for farmers, and provide an incentive to intelligent forest development on the part of the public generally.

It is expected by the Pennsylvania Railroad Company that in case no substitute for the wooden tie is developed during the next thirty-five or forty years, the company will have available a portion of the enormous supply of timber needed for cross-ties, which, at the present time, are becoming exceedingly expensive.

NATIONAL FORESTS REDISTRICTED

PRESIDENT ROOSEVELT has signed executive orders making important changes in the boundaries of practically all of the National Forests in the States of California and Washington. This is another step in the comprehensive plan of redistricting the National Forests in all of the western states.

No addition in forest area is involved in the redistricting plan. The object of the work is to equalize the area of administrative units and to arrange their boundaries in such a manner as to promote the most practical and efficient administration of the forests. It will enable officers of the Forest Service to give prompt attention to all forest business and further the interests and add to the convenience of stockmen, lumbermen, miners, and other users or settlers in the National Forests. The California National Forests which will be affected by this rearrangement are as follows:

The San Gabriel and San Bernardino National Forests will be combined in a new forest to be known as the Angeles. Supervisor R. H. Charlton, who has been in charge of the San Gabriel and San Bernardino Forests will be in charge of this new Forest, with headquarters at Los Angeles, as at present. The Forest is located in San Bernardino Los Angeles, and Riverside Counties, California, and has an area of 1,360,021 acres.

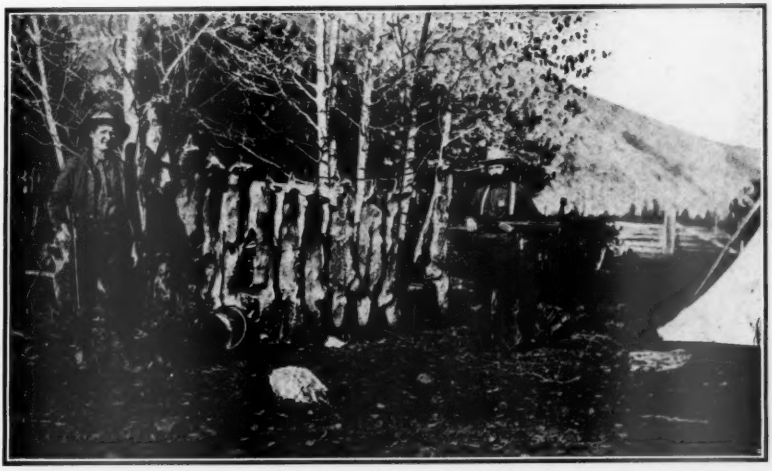
California is the name given to what was formerly the Stony Creek National Forest, along with a part of the Trinity National Forest, approximately in T. twenty-six, N., R. eleven W., M. D. M. Supervisor Ernest Britten, who has been in charge of the Stony Creek National Forest will be in charge of this Forest, with headquarters at Willows, Cal. The new California Forest is located in Trinity, Tehama, Mendocino, Glenn, Lake, and Colusa Counties, and has an area of 969,809 acres.

The new Inyo National Forest will include the old Inyo and Sierra (E) National Forests with the White Mountains addition to the Inyo National Forest, beginning aproximately on the south side of T. thirty, S., R. thirty-six, E., M. D. M., and extending about twelve miles north of the California and Nevada state lines in approximately T. one, N., R. twenty-five, E., M. D. M. Supervisor A. H. Hogue, who has been in charge of the Inyo and Sierra (E) National Forests will be in charge of this Forest, with headquarters at Bishop. This Forest is located in Mono and Inyo Counties, California, and in Esmeralda County, Nevada, and has an area of 1,501,980 acres.

The Klamath National Forest has been combined with the Goose Neck Addition on the east side, a small part of the Trinity National Forest on the north, and part of the Shasta National Forest on the west, and will continue to be known as the Klamath National Forest. Supervisor R. L. P. Bigelow will continue in charge of this Forest with headquarters at Yreka. This Forest has an area of 2,079,680 acres located in Del Norte, Siskiyou, Humboldt, and Trinity Counties.

Lassen is the name given to the new Forest consisting of the Plumas, Diamond Mountains, and Shasta embracing 1,229,076 acres. It is located in Lassen, Shasta, Tehama, and Butte Counties, and will be under the administration of Acting Supervisor A. H. Kling, with headquarters at Red Bluff.

The new Modoc National Forest is what has been known as the Modoc and Warner Mountains and will embrace 1,165,536 acres. This Forest will continue under the administration of Supervisor C. E. Rachford, with headquarters at Alturas.



WORK IN A NATIONAL FOREST

Predatory Wild Animals Killed by Guards and Rangers

A new National Forest, to be known as the Mono, will contain 656,640 acres, and will consist of portions of the Tahoe, Stanislaus, Sierra, and Inyo Forests. It is located in Alpine and Mono Counties. This Forest will be under the administration of Acting Supervisor J. C. Wells, with headquarters at Gardnerville, Nev.

Monterey is the name given to what was formerly the Pinnacles and San Benito National Forests, embracing 514,477 acres. It is located in Monterey, San Benito, and Fresno Counties. This Forest is under the administration of Supervisor N. O. Torstenson, with headquarters at Salinas.

The Plumas National Forest will consist of the Plumas, Diamond Mountain, and a portion of the Tahoe, embracing 1,333,280 acres. It is located in Lassen, Plumas, and Butte Counties, and continues under the administration of L. A. Barrett, with headquarters at Quincy.

The Santa Barbara National Forest, with a small part of the San Gabriel in the northwest corner, and a small part of the San Luis Obispo in the southern part, will remain the Santa Barbara. Supervisor Willis M. Slosson continues in charge, with headquarters at Santa Barbara. Its area is 1,962,200 acres, located in Santa Barbara, Ventura, and Los Angeles Counties.

The new Cleveland National Forest includes what was the San Jacinto and Trabuco Canyon, and embraces 1,904,826 acres. It is located in Orange, San Diego, and Riverside Counties, and will be under the administration of Supervisor H. A. E. Marshall, with headquarters at San Diego.

The San Luis Obispo National Forest will hereafter be known as the San Luis National Forest. Supervisor E. S. Mainwaring continues in charge with headquarters located at San Luis Obispo. It is located in San Luis Obispo County and has an area of 259,100 acres.

The Sequoia National Forest will consist of the Sierra (S) and will have an area of 3,014,400 acres. It will be administered by Acting Supervisor W. C. Burton, with headquarters at Hot Springs. This Forest is located in Fresno, Tulare, Kearn, and Inyo Counties.

The Shasta National Forest and a small part of the Klamath on the west side will continue to be known as the Shasta National Forest. Acting Supervisor H. B. Rider will be in charge of

this Forest, with headquarters at Sisson, Cal., as at present. The area of this Forest is 1 089,280 acres, located in Shasta and Trinity Counties.

The name of the Sierra National Forest, with new additions on west side, beginning, approximately, T. five. S., R. twenty, E., M. D. M., and running in a general southeasterly direction to T. twelve, S., R. twenty-four, E., M. D. M., will not be changed. Supervisor C. H. Shinn will continue in charge of this Forest, with headquarters located at Northfork. This Forest is located in Fresno, Madera, Mariposa, and Tulare Counties, and has an area of 1,911,840 acres.

The Stanislaus National Forest, with a small part of the Sierra (N) in the northwest part, will continue to be known as the Stanislaus. Acting Supervisor R. W. Ayers will be in charge of this Forest, with headquarters located at Sonora. The area of the Stanislaus is 1.114,380 acres, located in Calaveras, Alpine, Tuolumne, and Mariposa Counties.

The Tahoe National Forest, with a portion of the Stanislaus, will continue to be known as the Tahoe National Forest. Supervisor Madison B. Elliot will be in charge of this Forest, with headquarters located at Nevada City. The area of the Tahoe is 1,652,960 acres, located in Sierra, Yuba, Nevada, Placer, Eldorado, Amador, and Alpine Counties.

The name Trinity will be retained for the new Forest which was formerly Trinity National Forest, with a small part of the Shasta in the southwest corner. Supervisor F. H. Hafley will be in charge of this Forest, with headquarters located at Weaverville. The Trinity is located in Humboldt Trinity, Shasta, and Tehama Counties, and has an area of 1,718,400 acres.

The Washington National Forests redistricted are as follows:

The Chelan National Forest will have an area of 2,048,640 acres and will consist of that portion of the Washington National Forest formerly known as the Washington (East). It is located in Chelan and Okanogan Counties. The Forest will continue to be administered by Supervisor George W. Milham, with headquarters at Chelan, Wash.

Approximately 946,880 acres, comprising the southern portion of the Rainier Forest, will form the new Columbia National Forest. It is located in Lewis, Cowlitz. Klickitat, Skamania, and Yakima Counties. The Forest is to be administered by Acting Supervisor Thos. P. McKenzie, with headquarters at Portland, Oreg. Mr. McKenzie is promoted to this position from Deputy Supervisor of Wenaha Forest.

No change is made in the boundaries of the Colville Forest, which has an approximate area of 869,520 acres, located in Okanogan and Ferry Counties. It will also continue to be administered by Supervisor W. W. Cryder, with headquarters at Republic, Wash.

The Olympic Forest also remains without change and has an approximate area of 1,594,560 acres and is located in Clallam, Chehalis and Mason Counties, under the administration of Supervisor Fred Hansem, with headquarters at Hoodsport, Wash.

The Rainier Forest includes the northern part of the old Forest of this name and a small part of the Washington (W), and will have approximately 1,676,160 acres. It is located in Pierce. Lewis, Skamania, Kittitas, and Yakima Counties. This Forest will continue to be administered by Supervisor G. F. Allen, with headquarters at Orting, Wash.

Snoqualmie is the appropriate name which has been given the southwest portion of what was formerly known as the Washington (West), with an area of approximately 1,004,166 acres. It is located in Snohomish and King Counties, and will be administered by Supervisor Burt P. Kirkland, with headquarters at Seattle, Wash.

The Washington Forest will have an area of 1,493,400 acres and will include the northern portion of what was formerly called the Washington (West). It is located in Whatcom, Skagit, and Snohomish Counties. This Forest is to be administered by Supervisor Charles

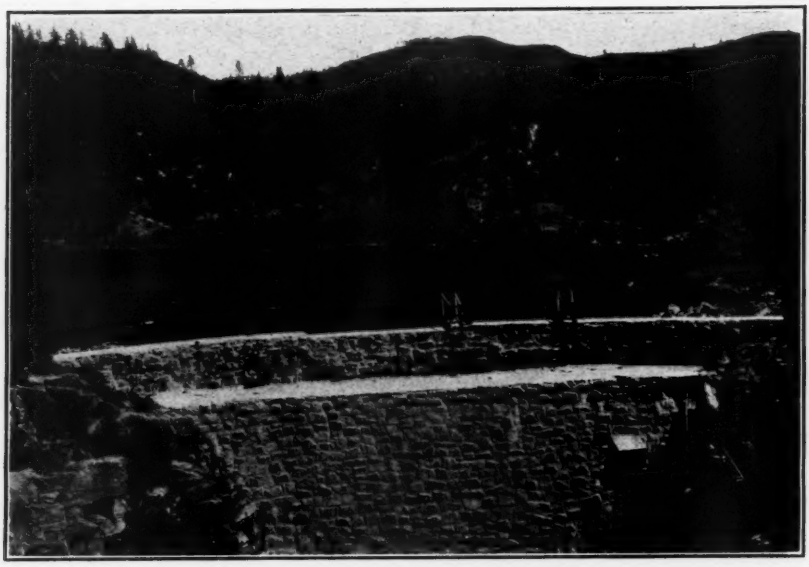
SCENE IN THE NEW CLEVELAND NATIONAL FOREST
Pinon and Juniper on Pinon Flat, at Edge of Colorado Desert

H. Flory, with headquarters at Bellingham, Wash.

The Wenaha Forest remains without change. It contains 813,342 acres, and is located in the States of Washington and Oregon. This Forest will continue to be administered by Supervisor J. M. Schmitz, with headquarters at Walla Walla, Wash.

The Forest to be known as the Wenatchee Forest includes the southeastern part of the former Washington Forest and has an approximate area of 1,378,569 acres. It is located in Chelan and Kittitas Counties, and will be administered by Supervisor A. H. Sylvester, with headquarters at Leavenworth, Wash.

The Forest Service desires to reduce the area of the average administrative units to approximately 1,000,000 acres. This was not possible in all cases, as is shown by the fact that under the plan of redistricting there will be 144 Supervisors in the United States, who will administer more than 167,000,000 acres of National Forests.



SCENE IN THE NEW CLEVELAND NATIONAL FOREST
Hemeh Reservoir Dam. Altitude, 4,500 Feet

MEMORIAL TO EX-PRESIDENT CLEVELAND

PRESIDENT ROOSEVELT, last month signed an executive order by which the San Jacinto National Forest, in southern California, has been renamed the "Cleveland National Forest," in honor of the President who established it. This Forest is at the same time consolidated with the Trabuco Canyon National Forest.

The President made public the following letter, which he sent to Mrs. Cleveland:

"My Dear Mrs. Cleveland: It has recently been my privilege to sign a proclamation changing the name of the San Jacinto National Forest to the Cleveland National Forest. May I express to you the very great pleasure it gave me to take that action—a pleasure mingled with a keen sense of the loss to our country and to our citizens in the death of President Cleveland.

"On February 22, 1897, President Cleveland signed the proclamation creating the San Jacinto Forest Reserve, in southern California. The date, February 22, was no mere accident, since the signature of the proclamation was timed to coincide with the birthday of our first President.

"President Cleveland was one of the first to recognize the need of forest preservation, and the creation of the San Jacinto and other forest reserves, with a total area of 25,686,320 acres, was one of the results of his foresight in this direction.

"Throughout his life he took great interest in conserving the natural re-

SCENE IN THE NEW CLEVELAND NATIONAL FOREST
Seed-collecting Camp in the Strawberry Valley

sources of the nation, and I particularly regretted his inability to attend the meeting of governors in May, because the meeting was in part the fruit of the seed he had sown years before.

"The name of Grover Cleveland will always be prominently identified with the movement to protect the forests of the United States, and it seems to me eminently fitting that one of the forests which he created should bear his name throughout all time.

"Sincerely yours,
"THEODORE ROOSEVELT."

The San Jacinto National Forest, together with twelve others, was created by President Cleveland on February 22, 1897. The recommendation of Hon. David R. Francis, Secretary of the Interior under President Cleveland, reads as follows:

"I respectfully suggest that the 165th anniversary (February 22, 1897), of the birth of the Father of Our Country could be no more appropriately commemorated than by the promulgation by yourself of proclamations establishing these grand forest reservations."

Eleven of these "reserves," as they then were called, were opposed in the West, and the proclamation creating them was suspended. But investigation showed their necessity and the proclamation was in due time confirmed.

When created the San Jacinto National Forest embraced 737 280 acres. It has, however, been enlarged since and now contains 1,904,826 acres. It is located in Orange, San Diego, and Riverside Counties. The Supervisor in charge is H. A. E. Marshall, whose headquarters are at San Diego.

The Forest policy of the Government was only just forming ten years ago. In 1896, the National Academy of Sciences, at the request of the Government, appointed a National Forest Com-

SCENE IN THE NEW CLEVELAND NATIONAL FOREST
Knocking Seed out of Pine Cones, in the Strawberry Valley

mission to investigate and report upon the inauguration of a rational forest policy for the forested lands of the United States. Mr. Gifford Pinchot, now Forester for the Government, was a member of that Commission, appointed for his well-known familiarity with forest problems, gained by study in this country and abroad. After the Commission had formulated a policy, Government experts from the German Empire and British India were consulted, who made suggestions as to details of organization, and, after several months spent in the Forests, set the seal of their approval upon the general scheme.

But there was a great deal for the public to learn about the true meaning of forestry. At first the Forests were called "reserves," and indeed for some years under a policy of restricted use, and in the absence of technical foresters in charge, resulted largely in locking up the natural resources. Mr. Pinchot, who took charge of the forestry work of the Government in 1898, worked steadily for the application of the principle of preserving the forests by wise use, and at length his efforts were crowned by success, when the "reserves," now better known as National Forests, were transferred to the Department of Agriculture in 1905.

Mr. Pinchot then found his hands free for the first time to open the Forests to the use of the public. As a result, the cost of administering the National Forests is now balanced by the sale of products, while at the same time, the condition of the Forests, as to timber, range, and stream flow, is steadily improving. The local needs of residents are met and the Forests are made to yield their harvest of wood, grass, and water without depletion. Development has replaced spoliation. .

FORESTRY AT THE BIENNIAL

By MRS. LYDIA ADAMS-WILLIAMS

THE ninth biennial convention of the General Federation of Women's Clubs, held at Boston, Mass., from June 22 to June 30, inclusive, was the most enjoyable and the most successful meeting yet held.

Boston's homes, hotels, and thoroughfares were thronged with prosperous-looking, self-possessed and reliant women, wearing the blue badge for which Boston hospitality will long be memorable, and who represented the foremost thought and progress in philanthropic, social, and economic work for the betterment of humanity. The roster shows an attendance of over 1,500 delegates and alternates from every state in the Union, while the visiting club women bring the list up to over 5,000 members who took part in the meetings. The membership of the General Federation of Women's Clubs includes over 800,000 active workers.

Through the efforts of Mrs. B. S. Peterson, of Chicago, chairman of the Forestry Committee of the General Federation of Women's Clubs, forestry was given an important place in the deliberations of the convention. One entire evening was given to the subject; this was followed by a round table and conference which occupied all of the next afternoon.

Interest in forestry and forestry work accomplished formed the theme most frequently heard during Biennial week in the reports of state presidents of clubs, chairmen of committees, and others.

A report sent by Miss Myra Dock, of the Pennsylvania State Forestry Association, was received with enthusiasm. The report was accompanied by an exhibit of growing spruce and pine trees, variously aged, from two to six years, grown at the Mt. Alta nursery.

An earnest worker is Mrs. Wm. A. Johnston, of Topeka, Kans., a director of the General Federation of Women's Clubs, and who organized the first forestry club in the State of Kansas, May, 1903, five years ago.

Topeka is very proud of the work done by this club in transforming a triangle of land adjacent to the best part of the city, which had been used as a dumping ground for tin cans and other rubbish, into an attractive park. A benefit district was formed, the ground was purchased, redeemed of its unsightly features, and turned over to the park commission. The people of the district are willingly taxed for its maintenance.

Another director of the General Federation of Women's Clubs, Mrs. Edward Johnson, of 91 Prospect Street, Providence, R. I., who takes charge of forestry matters which come before the board of directors, is enthusiastic regarding the growing sentiment for forestry and the good results which she predicts will be speedily accomplished.

Among the strong, philanthropic, unselfish workers for our friends, the trees, is Mrs. Lovell White, of California, who came all the way from San Francisco, with a large delegation. Mrs. White is widely known for her unceasing efforts to save the Calaveras Grove of Big Trees in California, which are the oldest living things on the face of the earth, and which are in danger of extinction through private greed. Mrs. White has just been appointed chairman of the State Forestry Committee for California. With Mrs. H. T. French, of Moscow, Idaho, who is vice-president for that state, Mrs. White enjoys the distinction of being honorary vice-president for California of the National Irrigation Congress, which meets at Al-

buquerque, N. Mex., in September. An interesting incident in connection with the visit of the battle-ship fleet to San Francisco was related by Mrs. Lovell White. The civic committee of the Outdoor Art League of the California Club, Mrs. White, chairman, planted sixteen trees named for the sixteen battle-ships anchored in San Francisco Bay. Later these trees will be dedicated to the American navy.

A significant feature of Biennial week was the reports of presidents of state federations, in which forestry work accomplished by the clubs of each state formed an important part.

Selected at random, a few reports follow:

Mrs. Chas. C. Capen, Williamantic, Conn., says: "635,000 forest trees planted in Connecticut."

Mrs. Lorin Webster, Plymouth, N. H., brought assurance of continued faithful work for the establishment of the Appalachian National Forest.

Enthusiastic applause greeted the statement that the first land given in New England to be used for public-school purposes was given by a woman, Bridget Graffort, and the Graffort Club of New Hampshire is named for her.

Mrs. F. H. White, of Lewiston, Me., stated that this is a banner year for forestry in Maine, and that interest continues unabated.

"Ten thousand acres in forest reserves, and an appropriation of $25,000 to buy five or six thousand more acres," is the encouraging report of Mrs. Henry H. Dawson, of Newark, N. J.

Mrs. Edward W. Biddle, Carlisle, Pa., reported intense interest in forestry and that the work is growing steadily.

Mrs. Stoddard Hammond, of Binghampton, N. Y., announces steady progress, and that the Women's Clubs stand eager and ready to do all in their power for forestry.

Mrs. W. B. Burney, of Columbia, S. C., is proud of the forestry work accomplished by the Women's Clubs. She emphasizes the especial need of work in that state.

"Forestry has been cannonized in Vermont," says Mrs. P. F. Hazen, of St. Johnsbury. The audible ripple of mirth led one to believe that the Women's Clubs had determined to cannonize some one unless forestry action be taken soon. Another earnest worker present from Vermont was Mrs. N. K. Fairbanks.

Professor Rane, state forester for Massachusetts, accompanied by Mrs. Rane, was present at the meetings. Professor Rane's two new books, relating to trees and primary instruction on trees, received general and favorable notice.

Among other distinguished and notable forestry workers present were: George Ward Cooke, of Haverhill, Mass., and Mrs. Mary P. Mumford, of Philadelphia, who introduced forestry in the General Federation of Women's Clubs six years ago.

Mrs. Alice F. Spalding 1016 Middlesex Street, Lowell, Mass., speaks enthusiastically of forestry work accomplished in Massachusetts.

Especially well received were the remarks of Mrs. Mason, former chairman of the State Forestry Committee of New Hampshire, who told of the damage to white birches by tourists and summer visitors, who, from thoughtlessness and ignorance, rather than from wilfulness girdle the trees to secure strips of bark. The bark never grows in, and the wanton act not only injures the looks of the tree and stunts its growth, but shortens its life as well. Through press bulletins and leaflets, it is hoped that education regarding this great evil may become general.

"The balsam fir of New Hampshire is in danger of becoming extinct," said the same speaker, "because of the vast quantities of it ruthlessly gathered by summer visitors."

Mrs. Josiah Evans Cowles, of Los Angeles, Cal., past treasurer of the General Federation and who has just been elected first vice-president, especially deplores the carelessness of hunters and campers, and others in starting disastrous forest fires. "We of the West realize that water is king," said Mrs. Towles. "To have water we must have forests, and to have forests we must

plant trees. If there were no other reason, the planting of trees is a valuable source of revenue."

The chairman of the Indiana State Forestry Committee, Mrs. N. L. Agnew, of Valparaiso, Ind., looks forward to legislation providing for a state tree and for planting forest trees where the land is unprofitable for agriculture, also to a law for the protection of shade and roadside trees, and to the appointment of a tree warden in every town, who shall protect trees from injury by animals, provide wire guards, and otherwise look after the trees in his district.

Among other state chairmen of forestry committees who took part in the forestry conference were: Miss Elizabeth K. Hobbs, of North Berwick, Me.; Mrs. Chas. H. Jolls, of Wyoming, Del.; Miss S. Elizabeth Demarest, 130 Bloomfield Street, Passaic, N. J.; Mrs. Milton Sawyer Woodman, West Lebanon, N. H., and Mrs. C. L. Hilleary, of Indianapolis, Ind.

At the formal meeting on Forestry the speakers were introduced by Mrs. P. S. Peterson.

Mrs. Peterson has devoted many years to practical forestry questions and is an enthusiastic and zealous worker. She has studied the question amid most favorable environment, the Peterson nursery at Chicago and extensive travel through the forests of Norway, Sweden, and Germany has added to her knowledge. She organized forestry work in the Illinois federation, and was the first chairman of Forestry in Illinois. She is the leader of large classes in forestry and tree-study among exclusive clubs in Chicago. Mrs. Peterson stated that for six years the women's clubs of the country had been systematically organized to promote work for forestry.

Mrs. Mary Reilley Smith, a prominent member of Sorosis Club, of New York City, was introduced by Mrs. Peterson as the author of the poem and song, "Scatter Seeds of Kindness," and spoke of the birds as "the sky children." The subject of her essay was: "The Voice of the Forest." Mrs. Smith said the insectiverous birds belonged to the economic department of nature, and that if they were destroyed, humanity would have a hard time getting along, even if man could exist on earth at all.

She appealed to woman's power to help to right the wrong of the extermination of birds of beautiful plumage because of the ruthless demands of fashion, and said it lay in the ability to choose between a rose and a feather. Mrs. Smith said, "I was once quoted as having said that wearing birds and wings brought wrinkles. I did not say that; I only said I wished it did."

Mr. Enos A. Mills, of Estes Park, Colo., gave a poetic essay on the woods in which he appealed to sentiment to save the trees from destruction. He gave many beautiful and graphic illustrations to show the humanitarian side of our forest friends and his charming word pictures of camp life appealed to all.

At the forestry conference, the discussion was opened by an address on "Waste of Natural Resources, Including Forests, and Need for Conservation," by Mrs. Lydia Adams-Williams, of Washington, D. C., who appealed to the women to take up the work of conservation and to save from prodigal waste and destruction the natural resources, including the timber, the waterpower, the soil, and the fuel and industrial minerals. Mrs. Adams-Williams referred to President Roosevelt's letter inviting Mrs. Sarah S. Platt Decker to the Governors' Conference, in which the President asked the cooperation of the women of the country in bringing the matter of conservation before the people.

Mr. Enos A. Mills also gave an address before the conference, which contained practical and helpful suggestions. A number of questions were asked from the floor, and a general discussion and short talks by chairmen of forestry committees, or their representatives, brought to a close a very interesting conference.

NEW COMMISSION AT WORK

Permanent Organization Completed at Chicago—Corrected Membership of the Commission—First Work Now Under Way

OVERSHADOWED, in the press dispatches, to a considerable degree by the news of a great national political convention being held at the same time, the executive committee of the National Conservation Commission met in Chicago on June 19 and perfected its organization. The first work of the Commission—that of taking an inventory of the Nation's natural resources—has already been put under way, and a report, to be presented at the meeting to be held in Washington next December, will be made from the findings of this "invoicing" committee.

As finally organized, the membership of the new Commission follows:

WATERS

Hon. Theodore E. Burton, Ohio, chairman.
Senator Francis G. Newlands, Nevada.
Senator William B. Allison, Iowa.
Senator William Warner, Missouri.
Senator John H. Bankhead, Alabama.
Mr. W. J. McGee, Bureau of Soils, secretary.
Mr. F. H. Newell, Reclamation Service.
Mr. Gifford Pinchot, Forest Service.
Mr. Herbert Knox Smith, Bureau of Corporations.
Hon. Joseph E. Ransdell, Louisiana.
Prof. George F. Swain, Institute of Technology, Massachusetts.
Brig. Gen. William L. Marshall, chief of engineers, U. S. Army.

FORESTS

Senator Reed Smoot, Utah, chairman.
Senator Albert J. Beveridge, Indiana.
Senator Charles A. Culberson, Texas.
Hon. Charles F. Scott, Kansas.
Hon. Champ Clark, Missouri.
Mr. J. B. White, Missouri.
Prof. Henry S. Graves, Yale Forest School, Connecticut.
Mr. William Irvine, Wisconsin.
Ex-Governor Newton C. Blanchard, Louisiana.
Mr. Charles L. Pack, New Jersey.
Mr. Gustav Schwab, National Council of Commerce, New York.
Mr. Overton W. Price, Forest Service, secretary.

LANDS

Senator Knute Nelson, Minnesota, chairman.
Senator Francis E. Warren, Wyoming.
Hon. Swagar Sherley, Kentucky.
Hon Herbert Parsons, New York.
Ex-Governor N. B. Broward, Florida.
Mr. James J. Hill, Minnesota.
Ex-Governor George C. Pardee, California.
Mr. Charles Macdonald, Am. Society of Civil Engineers, New York.
Mr. Murdo Mackenzie, Colorado.
Dr. T. C. Chamberlin, University of Chicago.
Mr. Frank C. Goudy, Colorado.
Mr. George W. Woodruff, Interior Department, secretary.

MINERALS

Hon. John Dalzell, Pennsylvania, chairman.
Senator Joseph M. Dixon, Montana.
Senator Frank P. Flint, California.
Senator Lee S. Overman, North Carolina.

Hon. Philo Hall, South Dakota.
Hon. James L. Slayden, Texas.
Mr. Andrew Carnegie, New York.
Prof. Charles R. Van Hise, Wisconsin.
Mr. John Mitchell, Illinois.
Mr. John Hays Hammond, Massachusetts.
Dr. Irving Fisher, Yale University, Conn.
Dr. I. C. White, State Geologist, West Virginia.
Mr. Joseph A. Holmes, Geological Survey, secretary.

EXECUTIVE COMMITTEE

Mr. Gifford Pinchot, chairman.
Hon. Theodore E. Burton.
Senator Reed Smoot.
Senator Knute Nelson.
Hon. John Dalzell.
Mr. W. J. McGee.
Mr. Overton W. Price.
Mr. G W. Woodruff.
Mr. Joseph A. Holmes.

The meeting of the Executive Committee was held in the office of the United States Reclamation Service, Federal Building, Chicago, at 12:30 p. m., June 19, 1908. There was present of the Executive Committee: Messrs. Pinchot, chairman; Nelson, Dalzell, Burton, Smoot, McGee, and Holmes; absent: Messrs. Woodruff and Price. There were also present Messrs. Flint, Van Hise, Newell, J. B. White, and Irvine. Dr. McGee acted as secretary pro tem.

After a brief statement of the purpose of the meeting by the chairman, Doctor Holmes suggested Mr. Thomas R. Shipp as secretary of the Commission. The suggestion was supported by Messrs. Newell, Nelson, and McGee; and Mr. Shipp was unanimously elected secretary.

Mr. Burton proposed that the chairman and secretary be authorized to correspond with Governors or other officials of the several states. Senator Flint concurred, suggesting that Governors be asked so to to arrange their communications as to facilitate reference to appropriate sections of the National Commission. After discussion, the action proposed by Messrs. Burton and Flint was unanimously agreed to.

The chairman suggested the advisability of inviting the Governors of the several states, or representatives to be appointed by them, to participate in a meeting of the National Commission, preferably after an initial meeting in which the organization might be perfected and a plan for a report adopted. The suggestion was approved. After Tuesday, December 1 (10 a. m.) had been selected for the first general meeting of the Commission, the place (preferably in the House Office Building in Washington) to be fixed by the chairman, Doctor McGee suggested either December 8 or December 15 as the time for the proposed joint meeting of the National Commission with the Governors or their representatives. After discussion, in the course of which it was agreed that the Executive Committee should have an outline report ready for discussion at the session of December 1, it was decided without dissent that the chairman should invite the Governors to a joint meeting to be held early in December, at a time and place to be fixed by him

Mr. Burton suggested that the Executive Committee issue bulletins of progress from time to time, announcing places and dates of meeting, reporting any action taken, and conveying other information of service to the Commission. The suggestion was generally approved and the chairman was instructed to carry it out.

The chairman announced that the President had issued an Executive Order to heads of Departments, instructing them to cooperate with the National Conservation Commission. After general discussion, on motion by Mr. Burton, it was decided that in the collection of information the chairman and secretary of each section shall act in behalf of that section and that the data shall be coordinated by the chairman of the Commission; and by general agreement the chairman was instructed

to secure such assistance as may be required for th preparation of special statements and reports. The suggestion of the chairman that the general reports of the Commision should b brief was approved.

Speaking on behalf of the Section of Water Resources, Mr. Burton gave notice of a proposed European trip, and invited members of the Executive Committee and other commissioners to join him in an inspection of several European rivers in July.

Senator Nelson suggested greatly needed lines of inquiry relating to the public lands, including extent, location, classification, modes of transfer, etc. He pointed out the desirability of carefully considering the methods of disposal of the lands. As a basis of recommendations to the Congress, he urged that the land laws of the United States, and so far as may be those of the several states should be codified. Mr. Newell and others concurred, holding that a reclassification of the public lands as affected by reclamation through irrigation and drainage is urgently required. After discussion of details, it was agreed that the chairman should have a codification of the land laws of the United States along the lines indicated by Senator Nelson commenced at an early day, with a view to a report by December next.

President Van Hise directed attention to the loss of phosphate salts, and suggested that the working of phosphate deposits and exportation of phosphates from the United States should be limited by law, and Doctor Holmes, on behalf of the Section of Minerals, undertook to begin inquiries during the summer with a view to an early report.

Senator Smoot suggested certain special inquiries relating to Forest Resources The matter was discussed by Messrs. Nelson J. B. White and Irvine, and Chairman Pinchot undertook to have special statements and reports prepared in time for the December meeting.

By general consent the chairman was authorized to communicate with presidents of national organizations concerned in the conservation of resources.

On motion of Senator Nelson, the meeting adjourned.

An inventory of the natural resources of the United States, in cooperation between the National Conservation Commission and the Executive Departments of the Government, is now going rapidly forward. At a meeting with the chairman of the Commission shortly after the organization of the Executive Committee, the chiefs of bureau concerned went over the general plan of work, made valuable suggestions regarding it, and cordially offered active cooperation in the collection of material needed for the preliminary report of the Commission, on January 1. Other chiefs of bureau, who were unable to be present, have since offered their assistance, with the result that the collection of material for the forthcoming report is actually in progress in every bureau concerned.

The compiling of the information furnished by the Executive Departments and from other sources has been placed in the hands of Mr. Henry Gannett, whose wide experience and achievement qualify him eminently for the task. Mr. Gannett, who is now just finishing his work as Assistant Director of the Cuban census has already taken up his duties for the Conservation Commission, and is in daily touch with the bureaus in which the material is being gathered. In order to hasten the work, the President has asked that Mr. Gannett be detailed to him, to assist the Commission, as soon as his duties upon the Cuban census will permit, so that he may devote his full time to the compilation of the material obtained. The President has also addressed to each chief of bureau engaged in the collection of material for the Commission, a letter expressing his pleasure at the enthusiastic cooperation offered, and expressing his sense of the importance of the work.

While much of the necessary material is either already available in the Executive Departments or obtainable by them, the Commission will also gather in-

formation from other authoritative sources. It looks forward to valuable cooperation with the Conservation Commissions of the respective states and with national organizations which were represented at the Conference of Governors at the White House last May. The Commission has announced, through letters to the Governors and to the representatives of these organizations, that it welcomes suggestions and information along the line of its inquiries.

The Commission is emphasizing the need of vigorous work in order that the Executive Committee may have the material collected in final form to lay before the Commission at its first meeting in Washington, on Tuesday, December 1, and likewise for the meeting of the Commission with the Governors, or their representatives, one week later, on Tuesday, December 8.

Cooperation between the states and the National Conservation Commission has become a marked feature of the Conservation movement since the last bulletin was issued. Within less than one month from the date of the President's letter appointing the Commission and advising the Governors that he had done so, the Govrnors of five states had named Conservation Commissions. These were Governor Norris, of Montana; Governor Chamberlain, of Oregon; Governor Folk, of Missouri; Governor Leo, of Delaware, and Governor Fort, of New Jersey. In addition (Governor Warner, of Michigan, has advised the Chairman of the Commission of the existence of the Forestry Commission of Michigan and also a Commission of Inquiry charged with the duties of securing all information and data possible regarding forestry.

Herewith is given a list of states that have already selected Conservation Commissions:

Delaware:
Conservation Commission—
Hon. George Gray, Wilmington, Del.
Hon. Benjamin Nields, Wilmington, Del.
Hon. James Pennewill, Dover, Del.

Michigan:
Forestry Commission—
Hon. William H. Rose, State Land Commissioner, Grand Rapids.
Hon. Chas. W. Garfield, Grand Rapids.
Hon. W. B. Mershon, Saginaw.
Secy., Hon. Chas. B. Blair, Grand Rapids.

Missouri:
Commission on Forestry—
Mr. Herman von Schrank, St. Louis.
Mr. O. L. Monger, Greenville.
Mr. D. A. Latshaw, Kansas City, Mo.
(Two members yet to be appointed.)
Commission on Waterways—
Mr. W. K. Kavanaugh, St. Louis.
Mr. W K. James, St. Joseph.
Mr. L. H. Jones Kansas City, Mo.
Mr. W. H. Black, Marshall.

Montana:
Forestry Commission—
Hon. Paris Gibson, Great Falls, Mont.
Hon. Robert B. Smith, Bigfork, Mont.
Hon. Lew L. Callaway, Virginia City, Mont.

Oregon:
Conservation Commission—
Hon. J. E. Teal, Chairman, Portland, Oreg.
Prof. F. G. Young, Secretary, Eugene, Oreg.
Mr. J. H. Lewis, Salem, Oreg.
Hon. J. C. Stevens, Portland, Oreg.
Hon. W. K. Newell, Dilley, Oreg.
Hon. Austin T. Burton, Hillsboro, Oreg.
Prof. J. R. Wilson, Portland, Oreg.
Hon. Richard Montague, Portland, Oreg.
Prof. E. R. Lake, Corvallis, Oreg.
Mr. C. S. Jackson, Portland, Oreg.
C. B. Watson, Ashland, Oreg.
Frank J. Miller, Albany, Oreg.
Mr. J. N. Hart, Baker City, Oreg.
Mr. Will R. King, Salem, Oreg.

In addition to these the states of New Jersey and Illinois have appointed conservation commissions, but the names of the members have not yet been made public.

The Governors of several other states have announced their intention to appoint Conservation Commissions in the near future. The Governors generally express commendation of the action of the President in appointing the National Conservation Commission and pledge their hearty cooperation in any plans of the Commission for forwarding the Conservation movement. Such cooperation has been promised by Governor Hanly, of Indiana, who announces his purpose to appoint a State Conservation Commission in the near future; Governor Deneen, of Illinois, who says he will soon send in the names of the Conservation Commission he is to appoint; Governor Ansel of South Carolina, who intends to take up the matter of the appointment of a state commission at a very early date; Governor Glenn, of North Carolina, who will recommend to the next legislature of his state action necessary to enable the State Geological Survey to cooperate with the National Conservation Commission in the preservation of natural resources; Governor Noel, of Mississippi, who will urge the next legislature of Mississippi to enact such legislation as will secure the full help of the state toward a wise solution of the important problems involved in the conservation of natural resources; Governor Curry, of New Mexico, who expresses his intention to appoint a strong and representative territorial Conservation Commission; Governor Willson, of Kentucky; Governor Davidson, of Wisconsin; Governor Harris, of Ohio; Governor Guild, of Massachusetts; Governor Swanson, of Virginia; Governor Stuart, of Pennsylvania; Governor Woodruff, of Connecticut; Governor Dickerson, of Nevada; Governor Gillett, of California; Governor Johnson, of Minnesota; Governor Cutler, of Utah, and Governor Sheldon, of Nebraska.

In addition to the cooperation of the Executive Departments and the Governors with the National Conservation Commission, various organizations which were represented at the White House Conference are offering valuable assistance.

The National Lumber Manufacturers' Association has named a special committee to cooperate with the National Commission and to hold its sessions in Washington. The American Academy of Political and Social Science has appointed a special committee "to offer suggestions and to be of service wherever and whenever possible." This committee is made up as follows:

Dr. Emory R. Johnson, chairman, University of Pennsylvania, Philadelphia, Pa.

Dr. L. S. Rowe, University of Pennsylvania, Philadelphia, Pa.

Dr. S. M. Lindsay, Columbia University, New York, N. Y.

Dr. S. N. Patten, University of Pennsylvania, Philadelphia, Pa.

Dr. John H. Gray, University of Minnesota, Minneapolis, Minn.

The National Board of Trade advises the chairman that it has a Committee on Conservation of Natural Resources, and that it expects to call this committee together and give the National Commission detailed and specific information from the standpoint of the National Board of Trade. The American Paper and Pulp Association offers its cooperation, and through its president announces that the subject will be taken up at its next meeting, the latter part of July. Dr. Ira Remsen, president of the National Academy of Sciences, announces that he will bring the whole matter of the conservation of natural resources to the attention of the Academy at its next meeting and he says he regards it as not unlikely that a committe of the Academy will be appointed to cooperate with the National Commission. Mr. J. B. Dort, president of the Carriage Builders' National Association, says he will be glad to bring the subject of conservation before his organization with a view to furnishing the National Commission specific data in the Association's particular field.

TREES AND THEIR NAMES

SOME kinds of trees have as many aliases as the criminal with the longest police-court record. For many reasons this is most unfortunate. To scientists, the confusion which results when people mean different things by the same word or use different words for the same thing, is intolerable, and therefore they use a carefully devised and carefully guarded system of nomenclature.

The every-day man is apt to be impatient with what seems the pedantic fondness of the botanist for jaw-breaking Latin names, which mean nothing to the uninitiated, when common usage supplies a familiar name. But the trouble is that on the familiar name there is seldom any agreement. Hence many misunderstandings, many friendly disputes, and often failures even of those who know a good deal about trees to distinguish correctly the different kinds of trees and woods.

School teachers are paying more and more attention to nature-study work, and in nature study are paying more and more attention to forest trees because of the general interest in forestry. At best there are difficulties enough in the way for those who have not had special training in forest botany, when it comes to identifying specimens of leaves and twigs brought to them by their pupils. Leaves, particularly, often vary greatly not only in different regions, but also in the same locality, and even from different parts of the same tree. The lack of agreement on the common name adds another complication.

If it were possible to bring every one to accept one name for each kind of tree there would be a decided advantage not only through making it easier to recognize trees, but also through clearing up confusion as to the woods in common use. The makers of popular tree books have tried to promote uniformity, often by following the usage given preference by the United States Forest Service, which has made a careful study of popular usage to the end that as much authority as possible may be given to the name most widely and commonly used. But unfortunately it is too much to expect that absolute uniformity can ever be brought about.

The trouble is almost always over what the botanist calls the specific name. It is easy enough to tell an oak from a maple, and there ought not to be much uncertainty—though there often is—as to whether a tree is a pine or a spruce. But oak, maple, pine, and spruce are generic names, and each genus includes a number of species. Here begins a confusion which often approaches chaos.

Not only do different localities apply different names to the same species and the same name to different species; in the same locality several different names may be used for a single species, very likely, with false distinctions where no botanical basis for a distinction exists. For instance, a certain oak often called both black and yellow oak used to be split into hand-made lath in early days, and hence got also the name of "lath oak;" but since to make good lath a straight-grained tree was needed, some woodsmen think that a black oak, such as the lath-maker would have selected by its looks, is a different kind of tree from other black oaks. Black oak is also used as a sub-generic term for all the many kinds of oak which, unlike the white oaks, have leaves with bristle-tipped lobes, and take two years to mature their acorns.

Indeed, the local names given to the forty-seven different oaks which form forest trees in the United States are almost without limit. The true white oak, however, the noblest tree of the oak

tribe, seems to have no nickname except in Arkansas, where it is occasionally known as stave oak. But a good many other kinds are also called white oak.

What is called black locust in Pennsylvania is yellow locust in Massachusetts, white locust in New York, red locust in one part of Tennessee and green in another. In Maine it is simply locust, in Louisiana acacia, in Minnesota honey locust, and in Maryland post locust. These many names overlap and are not strictly separated by state lines. On the other hand, the true honey locust (which belongs to an altogether distinct genus from the black locust), is known also as black locust, sweet locust, thorn locust, locust, three-thorned acacia, thorn-tree, honey shucks, piquant amourette, Confederate pintree, and a few other names.

White pine is a tree of so distinguished appearance that it is entitled to one name among lumbermen as well as among botanists. But it does not have it. In both Massachusetts and South Carolina it is sometimes known as Weymouth pine, which is its universal name in Europe. Pennsylvanians occasionally speak of it as soft pine, Tennesseeans as spruce, and in other parts of the South it is called Northern pine.

The loblolly pine is a southern tree, and the people of the South have been liberal with names, sometimes applying several in a restricted locality. In North Carolina it is loblolly oldfield, torch, rosemary, slash, shortleaf, sap, Indian, yellow, swamp, and longstraw, each being followed by the word "pine." In Maryland it is longshucks, in Delaware longschat, in Virginia cornstalk, foxtail, spruce, swamp, and others. It is called meadow pine in Florida.

From New England to the Carolinas the tulip poplar is frequently called white wood or tulip tree. Yellow poplar is its usual name in Pennsylvania, West Virginia and Kentucky, and on the market in the form of lumber. It is tulip poplar in Illinois, poplar in Ohio, white poplar in Indiana, blue poplar in Delaware, hickory poplar in Virginia, popple in Rhode Island, cucumber tree in New York, and canoe wood in Tennessee.

The birches are equally rich in names, and some of the names cling after the lumber reaches market. "Cherry" and "mahogany" furniture may be made from what in Maine is known as sweet birch, but which changes its name at the crossing of almost every state line as the tree's habitat is traced southward.

Scarcely half a dozen of the almost 500 species of forest trees found in the United States are popularly known by their botanical names. A few, however, are so known, among them being catalpa and sassafras. But even these suffer through mispronunciation by those who try to speak them. Catalpa is sometimes catawba, and sassafras is badly broken up by those who try to say it. The word itself is a corruption of two Latin words meaning "stone breaker." It is possible that it was so called because its roots sometimes grow in crevices of rocks and may force the ledges apart. Some of the mispronunciations are saxifrax, sassafac, and sassafrac.

When mistakes are made in the identification of wood furnished for building purposes, much embarrassment and trouble often result. Architects, builders, and other users of lumber find that the situation is growing worse each year, because many of the kinds of lumber formerly in heavy supply are now growing scarce and substitutes are gradually taking their places. To meet this one demand of identification of trees by wood structure, the Government has established a laboratory which renders free service to all users of timber. This laboratory is in charge of a trained dendrologist of the United States Forest Service, whose prompt advice may be had by architects, builders and other wood users who send specimens of woods for examination addressed to the Forester at Washington.

EDITORIAL

A Remarkable Speech

NEAR the close of the last session of Congress a Senator from one of the western states delivered a remarkable speech—remarkable from many points of view. The speech was delivered in the course of the discussion over the appropriation for the United States Forest Service, and in it the Senator made so many statements that are at wide variance from the known facts that the speech seems to require attention. Among the statements made in this remarkable utterance were the following:

That Forest guards, rangers, etc., are an arrogant class of government employees; that acts of violence at their hands are of frequent occurrence; that a citizen of the state represented by the Senator speaking had been set upon, on the open highway, and feloniously shot simply because the said citizen refused to give the road to the guard—the citizen at the time being in a vehicle, while the guard was mounted. It was further stated that the Forest Service requires its guards, rangers, etc., to wear a uniform; that the Senator himself had often seen such uniformed guards lounging upon the piazzas of summer-resort hotels, sporting their livery and wearing cocked and cockaded hats; that costly steam yachts were provided —paid for out of Government funds— for the sole use and pleasure of the guards, rangers, and others of the Forest Service. And, finally the statement was made, virtually, that the entire Forest Service is a farce, if nothing worse, and that it is conducted solely for the profit and aggrandizement of certain individuals, actually accomplishing no good whatever, and of no benefit save to a favored few.

This truly remarkable utterance, as we say, seems to require attention; not because the Forest Service needs defenders—its work shows for itself—but because there are many men, both in public and private life, in the western states, who make a practice of going about the country delivering themselves of these and similar utterances, thereby creating impression that are wholly unjustified by facts. Taking the above statements up *seriatim*, the answers follow:

The Murderous Guard

THE shooting episode spoken of by the Senator has become a classic in the West. During a trip last summer, in which the writer went into half a dozen far western states, he heard this story a score of times. Each time the actors in the drama were differently named, and the location of the shooting was different with each teller of the tale. At last becoming skeptical after having heard of the shooting as happening in Colorado, Wyoming, Idaho, Montana, Utah, and Arizona, the writer set about learning the truth of the story. It was found that there had actually been a shooting affair, in which the aggressor was a forest guard. The shooting occurred on a forest road traversing a National Forest in Idaho, but it was not found that any one was actually shot, the information being that the guard—a man named Wagner —had fired either into the air or into the ground, and the private citizen being uninjured. However, this much was learned: The shooting did occur, and it was done by a forest guard. Wagner, the man who did the shooting, was promptly arrested by forest officers, haled into an Idaho court,

where he was fined, and he was as promptly discharged from the Forest Service as being unfit to hold a position therein. Wagner's connection lasted exactly seven days he being discharged at the end of that time "for the good of the Service." A trivial affair to have been spread all over the West; and it has certainly grown pretty thin in the spreading process.

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Uniforms of Forest Officers

AS TO the uniforms to which the Senator takes such violent exceptions. The Senator's statement to the contrary notwithstanding, forest officers are not required to wear uniforms. They may do so if they choose, and in such case very flexible regulations are provided. The uniforms, if worn, are to be of army khaki, olive brown, with numerous and capacious pockets, any style of footwear fancied by the wearer, and the hat—that terrible cocked and cockaded chapeau so forcefully described by the western Senator—is simply the regulation western Stetson—no more and no less. There is no compulsion whatever in this matter of uniforms; forest officers may wear them or not, just as they see fit. No man is disciplined in any way if he chooses to go without a uniform, but it is suggested by the Forest Service, that, for the protection of the general public, some sort of distinguishing uniform is desirable, so that individuals may know with whom they are dealing in matters concerning National Forests. The object is identical with that sought to be served by uniforming mail carriers, policemen, firemen, and other public servants, and the Senator's argument would apply equally well to any of these. If uniforms are so distasteful to the Senator, he should introduce a bill requiring all mail carriers, etc., to discard the odious badge of servitude; there would be exactly as much common sense in such a proceeding as in the demand for the elimination of a fixed and rigidly required foresters' uniform — besides which, the latter doesn't exist.

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Costly Steam Yachts

SEVERAL of the National Forests are located on large bodies of water —lakes, rivers, bays or sounds—around which travel is extremely difficult on account of natural obstructions. Several such forests have been supplied with small launches—none of them even approaching in size a yacht—for use in tours of inspection, trips from point to point, and in case of desperate emergency requiring the presence of several forest officers at a certain point with the least possible waste of time. Now, it certainly does seem to be "stretching the blanket" to the point of uttermost tension to designate a twenty-five foot or thirty-foot launch a "costly steam yacht." Perhaps, however, this may be accounted for by reason of the Senator's unfamiliarity with yachts. Life in the altitudinous fastnesses of some of the western states is not calculated to familiarize one with shipping, to any marked degree; and his reading may have given the Senator the impression that any small boat from a canoe up, is a yacht. "A primrose on the river's brim, a simple primrose was to him," as it were. But these are some of the things the forest officers do with those "costly steam yachts:" They make in a couple of days trips around lakes that, were the trips made by land, would require two weeks; they make hurried dashes and cut off the retreat of poachers, outlaws, and the like, saving local law officers days or weeks of hard riding and comfortless camps; and they make it possible to check forest fires that, allowed to gain the headway they would gain were it not for the little vessels, would destroy thousands of dollars worth of valuable timber. Indeed, one such instance occurred only last summer; the fire, just starting, was extinguished be-

fore it gained any headway at all, and the timber saved thereby is worth more than the total cost of all the launches yet bought by the Service. The fire started in the timber on the hills above the lake; to make the trip around the end of the lake, by land, would have taken the better part of two days; the launch made it across in an hour or so. We might say that steam fire engines are a needless extravagance on the part of a city; the engines stand idle the greater part of the time. But suppose cities were without them?

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The Service Itself

FINALLY, is the Forest Service a valuable, hard-working, indispensable part of the Government, or is it, as the Senator says, a farce? If it were the latter, we fancy there would be less opposition to it in the West—or anywhere else, for that matter. No organization, of whatever character, that is not more than ordinarily active, and that is not doing a great deal of work, is ever abused. No; the Senator is unhappy in his choice of adjectives. Active, aggressive, even impertinent—when its activities are looked at from the viewpoint of certain equally aggressive western interests—the Forest Service may be, but never farcical. It is doing a work that is perhaps more vitally necessary to the well-being of the whole country than that of any other single bureau of the Government. Only the preliminary steps in the work have as yet been taken; the labors that remain to be performed overshadow the actual accomplished work as Pike's Peak overshadows the foothills. If the forests of the West are to be saved from a fate like that which has already overtaken those of the East, the work of the Forest Service must go on, increasing in scope as it proceeds. How any man who pretends to the ability to think consecutively and to reason from premise to conclusion can say there is no need for the work of the Forest Service, and that the views advanced by it are the babblings of cranks and hare-brained theorists, passes the comprehension of the writer. Practically the entire State of Michigan was, thirty years ago, covered with a dense stand of timber as valuable as that growing in any of the western states. Where is that timber now? Gone—absolutely and irrevocably gone; stripped to the sand and rocks of the eroded soil. The same is true of the greater part of Wisconsin. Likewise it is true of the mountains of Kentucky and Tennessee. True, too, of Pennsylvania; true of New York, and the New England States. True, also of the South Atlantic States. Is there any reason to believe that western timberlands will fare any better if left unprotected? And when those timber tracts of the West shall have been ravaged and stripped bare, what of the country? What of the farming lands that require irrigation water? What of the grazing lands that must have water? And, finally, what of the great, growing nation that must have timber and lumber?

It will readily be granted that certain individuals, who have a winning way with state officials, would be greatly benefited, financially, if they were unhampered in their operations by Forest Service rules and officials. Certain groups of stockmen in the range and grazing states, likewise, would probably fare better financially, were the Government to remove its hampering regulations—hampering only in so far as to make stockmen pay for the benefits they receive—and abolish the Forest Service. But that the Government will ever do any such thing is not to be thought for a single instant. Rather, the activities of the Forest Service will be increased from year to year; the work of the Reclamation Service will keep pace with it; the new Commission on the Conservation of Natural Resources will add its strength to the work of protection, and the country as a whole will not be long in seeing everywhere the benefits that flow from the work. The little group of westerners who want every tree and every blade of grass that grows on Government ground for their own use will doubtless

keep up their agitation—an agitation as childish as the speech of the western Senator referred to above—but the chorus of approval from the sensible, patriotic men and women of America will drown their feeble pipings in its swelling volume.

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Changing Our Title

READERS of FORESTRY AND IRRIGATION will have noticed, on the cover of the last few numbers of the magazine, the forecast of a change in title. In shadow-form the word "Conservation" has appeared across the face of the old name, and this shadow-forecast has grown stronger and stronger until, with this month, the old name passes into the background and is overshadowed by the new. With the September issue of the magazine, the title will be changed completely, and the new one, "Conservation," with the explanatory sub-title, "Woods and Waters; Soils and Ores," will take its place.

There are many reasons for this change of title, and a few words of explantation are due the members of the American Forestry Association and the subscribers and readers of the magazine. For some time it has seemed to those in charge of affairs that the title FORESTRY AND IRRIGATION does not fully cover the ground; that the magazine, as well as the Association, stands for more than these two features of the broad plan of national conservation of natural resources. Waterways and water-powers are to be conserved; soils are to be cared for and kept from wasting into the rivers and the sea; coal, iron ore, and other minerals are to be safeguarded and so used as to insure, both to the present generation and the generations to come, the fullest possible benefits from the mines of the country. And at the same time, the forests of the land must be taken care of, new forests established, devastated tracts covered once more with trees, so that the waterways may become again arteries of travel, rather than choked-up drains or roaring floods. Forested watersheds and hillslopes mean equable water-flows and clarified streams, that can bear on their bosoms fleets of steamers and barges. The reestablishment of a large water traffic means a lessening of the drain upon the iron mines and the coal beds; so that the plan of forest conservation, carried to its logical conclusion, means more to the nation than any other question that now faces us. Forest-crowned watersheds and forested slopes mean an increased and a continual, rather than an intermittent, flow of water in the streams and the rivers, and they mean, too, prevention of the silting up of the rivers, the mill-ponds, and the harbors into which the rivers empty. These things mean, in turn, the reestablishment of a vast inland water traffic, and this, again, means a lessening of the prodigal drain upon our mines of coal and iron, a lessening of transportation charges, and an incalculable lengthening of the life of the nation's natural resources.

These things being true, it was decided some time ago that it is time for the American Forestry Association to take a definite stand in the forefront of those who demand that a program of conservation be instituted and carried out to the uttermost. Forestry and irrigation are two vital points in the conservation program, but they are not the only points, by any means. The broader idea of conservation embraces forestry, irrigation, and all the other points we have mentioned; therefore, it has seemed fitting that the magazine, the official publication of the American Forestry Association, should indicate in its title the widening scope of the work that is before the Association. Expressions of opinion from individual members of the Association have so far been entirely approving; we invite other members to write us, discussing the change and giving their views as to what the Association and the magazine, under its new title, should stand for. We have mapped out a plan of campaign reaching many months into the future; we are endeavoring to give to our readers a better and a broader magazine than they have ever had be-

fore. The letters of approbation already received testify to the fact that we have not wholly failed in our efforts; now we want others who have not written to give us their views. The magazine belongs to the members of the Association, and we want the members to take an interest in their property.

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Our Membership Campaign

SOME time ago each member of the American Forestry Association received a letter giving the details of a plan for increasing the circulation of the magazine, and asking the cooperation of each member in making the plan a success. Later, a second letter was sent to those of the members who failed to respond to the first. The result of these two letters has been the addition to our lists of several thousand new subscribers to the magazine, and the subscriptions are still coming. We have called these "short-term subscriptions," and just here we want to urge every individual member of the American Forestry Association who has not yet done so to let us have his or her response to our letters.

The thousands of new subscribers we have added to our lists by this means are now being solicited to become members of the Association. No better list, for solicitation purposes, could possibly be secured than these new subscribers to the magazine. We have asked that in all cases the names of none but those believed to be in some degree interested in forestry and the general idea of conservation of natural resources be given us, and we have every reason to believe that the members have heeded our suggestion. Now it is our intention to give to these new subscribers—and to the old, as well—a magazine sufficiently interesting and attractive to make them want to ally themselves with the Association and thus take a part in the work that our organization is doing. Within the next few weeks every one of these new subscribers will receive a communication from this office, with an invitation to become a members of the Association. Present members who have sent in subscriptions can aid in the work of adding new members by calling the livelier attention of those whose names they sent in to our communications. We are beginning to plan for the next annual meeting, and before the time of that meeting we want to add many hundreds of new members to our rolls. This office will do its full share in the work of securing these new members; the magazine will exert every effort to attract and crystallize the interest of those who are now interested in a general way in the subject of Forestry and the broader subject of general conservation, and the members of the Association can help us wonderfully, if they will take the trouble to add the word that may turn the balance and decide the prospective member to become an actual member.

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A Word of Credit

WHILE we are on the subject, let us refer again to the "short-term subscribers" mentioned above, and let us give a word of credit where it is certainly due. When our first letters were sent it, it was somewhat of a question in our minds as to how our members would respond. We had never made an appeal of the sort, and we were naturally in doubt. However, the letters were carefully prepared, and, albeit with some misgivings, were sent out. The next morning, almost before the mail had been opened in our office, a member came in with a list of four "short-term subscribers," and the cash to pay for the subscriptions. Our letter had reached this member at 8 a. m.; at 8:45 a. m., she—for the member is a woman—handed in her little list the first to be received. We felt better about the appeal then, for we thought that if even one member responded so promptly, we had everything to hope from the entire membership.

That list of four names was the first we received in answer to our first letter. Since then we have received hundreds of responses, and we have added sev-

eral thousand subscribers to our lists. But that first list is remembered very gratefully; it seemed to us to be an augury of the success of our plan, and such it has proven. Mrs. Lydia Adams-Williams is the member who so promptly answered our letter; hers was the first list we received. There are members of the Association to whom the sending of a list of a hundred or more names would be a mere trifle; there are others, who, in sending in four names, have made a real sacrifice—a sacrifice that demonstrates more fully than many words the deep interest the senders feel in the Association and its work. It is in this latter class that Mrs. Williams belongs. And, somehow, we have wondered many times since that first morning after our letters went out just what some of our wealthy influential and prominent members would think if they knew that the first answer to our appeal came from a woman—and from a woman who could ill afford the response.

Death of ex-President Cleveland

IN THE death of ex-President Grover Cleveland, forestry, and conservation in general, loses a friend. The policy of extension of National Forests—or, as they were called during his administrations, forest reserves—was given, during his tenure of office great impetus; in fact, to Mr. Cleveland is due much of the credit for the foundation on a lasting basis of our forest policy. Mr. Cleveland was one of those whom President Roosevelt asked to attend the Conference of Governors, at the White House last May, as special guests of the Executive, and it was with the deepest regret that it was learned that the ex-President would not, on account of impaired health, be able to attend the Conference. An action that struck a popular chord with the members of the Conference was the submission of a resolution of sympathy by Hon. William Jennings Bryan, and this resolution was adopted in a manner as heartily sympathetic as that in which it was offered.

It was Mr. Cleveland who, when President, established the San Jacinto National Forest and others, with an aggregate area of more than 25,000,000 acres. Now it is a most graceful action on the part of President Roosevelt to change the name of the San Jacinto Forest to the Cleveland National Forest, thus making the forest a perpetual memorial to the man who, as President, established it.

Forestry, and the idea of national conservation of natural resources was not a popular subject during Mr. Cleveland's occupancy of office, and the fact that he took such a deep interest, even at that time, in the subject is an added indication of the mental greatness and deep understanding that characterized him. Failing health, in his later years, and other interests that overshadowed much else in his life, prevented his giving much attention to forestry, in a public way, but the work that he did as President, toward the establishment and extension of a National Forest system, stands as a demonstration of his unfailing grasp of great questions of national importance.

Secretary Will's Chautauqua Lectures

SINCE June 16 Secretary Will has been engaged in Chautauqua lecture work in Minnesota, Wisconsin, and Iowa. He is working under the Redpath Chautauqua System, speaking six nights per week before audiences averaging nearly 1,000. His addresses are being fully reported in the press. He carries with him an excellent lantern and a set of beautiful and instructive slides with which his lectures are illustrated. He is also accompanied by an operator to attend to the mechanical features of the work. To many of his hearers the subject is almost new. It receives careful attention, however, and its presentation arouses much interest.

Secretary Will's itinerary, up to July 13, covers the following points: Winona, Minn.; La Crosse, Wis.; West Liberty, Iowa; Cedar Rapids Iowa; Dubuque, Iowa; Eau Claire, Wis.; Inde-

pendence, Manchester, Anamosa, Maquoketa, Belle Plaine, Waverly, Osage, New Hampton, Waukon, Decorah, Cresco, Mason City, Northwood, and Hampton, all in Iowa; Austin and Albert Lea, Minn., and Perry and Forest City, Iowa. An address was delivered at each of these points except Dubuque, where the meeting was prevented by the violent storm of June 20. The work closes on August 30, and includes nineteen points in Missouri. A more effective method of breaking new ground and carrying to the people the truth for which the American Forestry Association stands would be hard to devise. The following report indicates the scope of the lecture:

"Our matchless resources have long been our pride. We have thought them inexhaustible. We have used them prodigally and abused them unpardonably.

"To-day two great facts face us. First, is the growth of our population. A half century hence will find on American soil probably 200,000,000 people. Feeding, clothing, and sheltering these would be a problem, even though our resources were unfailing as the widow's cruse of oil.

"But the second fact is more ominous; it is the depletion or exhaustion of those resources. Buffalo, fish, artesian water, natural gas, and oil, are swiftly going or gone. Coal, chief source of artificial heat and power, is the basis of our material civilization. Its volume is estimated as equalling a cube nearly eight miles on the edge. Yet we waste vastly more than we utilize. Further our consumption by decades, once trebling and quadrupling, is still almost doubling. Unless wise economies are promptly adopted another hundred years may be expected to empty our national coal bin.

"Because both of their intrinsic importance and the dependence upon them of other vital resources and interests, our forests are of inestimable value. We consume each year enough lumber to floor the State of Delaware, enough shingles to shingle the District of Columbia, enough lath to load a train reaching from Chicago to Memphis, enough cooperage stock to build a rick four feet wide and high, and extending from New York City to Colorado, enough firewood to make a one-mile cube, and enough railroad ties to build a railway around the globe with a side track across the Atlantic, while our annual wood bill exceeds a billion dollars. A New York newspaper consumes each three months a forest as large as Central Park, or 843 acres.

"Under present policies another third of a century will probably finish our wood supply. The resulting tragedy challenges human imagination.

"Further, the forest is a grand, natural regulator of stream-flow. With deforestation comes floods, destroying agriculture, commerce, and manufacturing.

"Our inland waters are probably our greatest natural resource. Neglect and railroad hostility have brought them into disuse and decay. But the railroads are now unable to handle our growing traffic, and an irresistible demand has arisen for the rehabilitation of our inland waterways. A national commission has been created to promote this work, but it finds rivers and harbors filling with washings from fields and slopes, while multiplied millions are annually spent by Congress to remove the effects without touching the causes. Of these causes, one of the chief is forest destruction, with resulting erosion.

"Two-fifths of the United States is arid, or semi-arid. This area exceeds that of the Roman Empire. Much of it is irrigable. Its value, reclaimed, will exceed a thousand times the cost of its reclamation.

"On June 17, 1902, Congress enacted the reclamation law, placing in the 'Reclamation Fund' the proceeds of certain public land sales. With this fund, the Government is constructing enormous dams, tunnels, and irrigation works, and converting the desert into a watered garden, the fund being constantly renewed from payments made by settlers upon these lands. Yet the Director of the United States Reclamation Service says: 'The water of this

work comes chiefly from streams rising in mountains. To maintain the supply of this water, it is essential that forests be maintained upon these mountains. To this end, National Forests are indispensable.

"While some of our soils are excessively dry, others are excessively wet. Our swamp area equals the area of New England, New York, and New Jersey. Much of it can easily and cheaply be drained, the resulting profits being vast. Properly tilled, this wet area would support a population equal to that of the United States. Further, sources of disease would, at the same time, be removed.

"A great drainage movement is now on, and legislation is pending in Congress. Yet drainage, like irrigation, is largely dependent upon forestry; for it is necessary not only to remove the excess of water, but to prevent its return. Hence, overflows of rivers must be checked; and, to this end, forests on slopes must be maintained.

"Our National Forest policy marks a wise and beneficent beginning. Such forests mean neither destruction nor yet the withholding from use; but the fullest use to which, in perpetuity, these forests can be put. They make it possible for us to 'eat our cake and have it, too.' Such forests, however, exist wholly in the West, on the public domain, where they were 'proclaimed' by successive Presidents. They are even worse needed in the East and South, where no public domain exists. Here the land must be bought. This necessitates an act of Congress. Such legislation is contemplated by the Appalachian-White Mountain bill, three times passed by the Senate, but each time blocked by hostile leaders in the House.

"The Southern Appalachian forests contain our last remaining important hardwood stock. As such, they are essential to the nation as a whole, to West and East alike. The East helped the West secure the Reclamation Act. It is ready to help develop the inland waterways. Western help, in turn, is imperatively needed for the establishment of national forests in the Southern Appalachian and White Mountains. Time is precious. The forests are going, while the price of the land is mounting. The American Forestry Association is leading in the fight for this imperatively necessary measure. It solicits the cooperation of every right-thinking citizen."

THE FOREST FIRE FIGHTERS

By ARTHUR CHAPMAN

The wind sweeps off the spire-like peak,
And is whirling the cinders high;
While down in the stifling, deadly reek,
We struggle, and all but die.

We have felled the trees in the fire's path,
Till our hands are bleeding and sore;
But always it speeds, with a hiss of wrath,
And leaps the barrier o'er.

We have fought it back, with blaze 'gainst blaze,
And yet has the foe slipped past;
But slowly we yield, in the choking haze,
Till the victory's won at last.

Small pay do we get, and thanks are gruff,
When we've fought the foe to his knees;
But, after all, the reward's enough,
When we hear the wind in the trees.

—*Denver Republican*

NEWS AND NOTES

Grand Canyon National Forest Made Game Preserve

THE President has signed a proclamation adding approximately 942,400 acres (from lands already included in the Grand Canyon National Forest), to the Grand Canyon National Forest.

The Game Preserve, as previously established, included that portion of the Grand Canyon National Forest lying north of the Grand Canyon, while the new proclamation includes all of that portion of the Forest lying south of the Grand Canyon except the southwest corner of the forest lying on the west side of Cataract Canyon and south of the township line between Townships Thirty-one and Thirty-two north.

This extension of the Game Preserve is in accordance with an act of Congress, approved June 29, 1906, entitled "An Act for the Protection of Wild Animals in the Grand Canyon Forest Reserves," providing "That the President of the United States is hereby authorized to designate such areas in the Grand Canyon Forest Reserve as should, in his opinion, be set aside for the protection of game animals and be recognized as a breeding place therefor."

Section 2 of this act provides, "That when such areas have been designated as provided in Section 1 of this act, hunting, trapping, killing, or capturing of game animals upon the lands of the United States within the limits of said areas shall be unlawful, except under such regulations as may be prescribed from time to time by the Secretary of Agriculture; and any person violating such regulations or the provisions of this act shall be deemed guilty of a misdemeanor, and shall, upon conviction in any United States Court of competent jurisdiction, be fined in a sum not exceeding $1,000, or by imprisonment for a period not exceeding one year, or shall suffer both fine and imprisonment, in the discretion of the court."

Section 3. "That it is the purpose of this act to protect from trespass the public lands of the United States and the game animals which may be thereon, and not to interfere with the operation of the local game laws as affecting private, state, or territorial lands."

The extension of the Game Preserve to include the land south of the Grand Canyon is considered imperative in order to protect the game now in existence. There are a few deer, wild turkeys, and grouse, and occasional small bunches of antelope in the vicinity of Cataract Canyon. This country is gradually becoming more and more accessible to hunters. Wild animals have become almost extinct, and the proclamation aims at the protection of the little game which remains.

The Grand Canyon, one of the scenic wonders of the world, has become very popular with tourists and visitors in the West owing to the ease of access and betterment of accommodations afforded by the various hotels along the rim. The protection of the game will add to the interest of tourists, and it is hoped that in the course of time the wild animals may become abundant.

* * *

Arizona's Mountain Forests

ARIZONA has the reputation of being a dry, hot country, and much of it justifies this reputation. Those thoroughly acquainted with the territory know, however, that there are mountains in Arizona, and on these mountains precipitation in the form of both rain and snow is surprisingly high. For example, Mt. Graham rises from the desert in southeastern Arizona to an altitude of over 10,000 feet, and its steep

slopes are heavily timbered with Douglas fir, western yellow pine, and Engelmann spruce.

These timbered mountains are blessings to the people of the territory in more ways than one. Streams in which the flow is regulated by the forests run down into the desert where every drop of water is used for irrigation. The forests also supply the people of the region with material for building their houses, for fencing, and with timber.

The timbered portion of Mt. Graham is in a National Forest. This means that the timber can be used, but cannot be abused. For example, the Government has sold to the Mt. Graham Lumber Company, the timber on an area which is estimated to yield 950,000 board feet, and the company is now cutting and sawing it and supplying the agricultural community in the valley of the Gila River with lumber, and the mines of the Globe mining district with timbers.

The company's mill is high up on the mountain side in a little opening in the dense timber. Here, one and a half miles above sea level, the logs are sawed into lumber and a flume seven and one half miles long carries the sawed lumber down through the rough canyon of Ash Creek to the base of the mountain where it can be hauled direct to the ranches where it is to be used, or loaded on cars and shipped to the mines. A flume in Arizona seems out of place, but there is plenty of water on Mt. Graham with which to operate it, and there always will be, for the Forest officers allow only carefully selected trees to be cut, and there will always be a good forest cover on the mountain which will protect the stream flow and supply timber for the future.

Soldiers Extinguish Fire in Arizona National Forest

A STORY of prompt action in suppressing a dangerous fire in the Garces National Forest, Ariz., is told in the three following dispatches which passed between Supervisor Roscoe G. Willson, of the Garces National Forest, Ariz., and Clyde Leavitt, chief of the office of organization, United States Forest Service, at Washington. Cooperation between the different branches of the Government in administering and protecting the public forest domain is one of the means by which the tremendous annual fire losses have been made a thing of the past.

"Nogales, Ariz., July 5, 1908.
"Forester, Washington, D. C.
"Fire in Tanner Canyon, Huachuca. Forest. Assistance troops requested post commandant Fort Huachuca.
"WILLSON."

"Washington, July 6, 1908.
"Willson Nogales, Ariz.
"War Department states Commandant Fort Huachuca instructed furnish all possible assistance extinguish Tanner Canyon fire.
"LEAVITT."

"Nogales, Ariz., July 7, 1908.
"Forester, Washington, D. C.
"Commandant Fort Huachuca wires me fire extinguished by soldiers.
"WILLSON."

Insure Timber Supply for Montana's Mines

IT IS an old story in Montana that the first information in regard to the Butte copper mines was a message to Marcus Daly, which read, "Cattle on the hills are looking well." The mines have more than justified this message, and to-day Butte is known as the greatest copper-producing town in the United States, if not in the whole world. The streets of Butte to-day are alive with teams hauling ore from the mines to the railroad, and timber from the railroad to the mines, for a mine produces a vacancy made by removal which must be partially filled with timber or the mine will cave in, and cannot be worked.

Butte uses 200,000 mining stulls annually. About three-fourths of this

number are secured from the Deerlodge National Forest west of the city. The Allen Company has purchased from the Government the timber which the Forest officers think can be removed with safety to the forest on an area of about 8,000 acres, and it is estimated that they will secure about 50,000,000 feet, board measure, under this one contract. The company also supplies the smelter at Anaconda with converter poles and small cordwood to whomever has need for it. By the time the sale is completed, the Government will have received more than $250,000 for the timber on this 8,000 acres, and the forest will still be left in a condition to produce more timber for the future needs of the Butte mines and other Montana industries.

The timber is almost wholly lodgepole—a tree of small size, at best, but large enough to supply stulls, lagging, and converter poles. The trees form a dense forest of nearly even sized trees. This renders it impossible to take out only the larger trees, and the Government foresters are allowing the cutting of narrow strips clean, while from the intervening strips of timber left standing only the dead and diseased trees are taken. After a strip is cleared, it will be seeded up with young trees from the strips of timber left standing on either side, and only when this has been completed, probably between ten or twenty years from now, will the remaining timber be cut. When it is cut, the trees then growing on the strips which are now cut clean, will seed up the newly cut areas, and the whole forest will be started afresh.

In this forest as in every other, the greatest danger to the program planned by the foresters is fire, but in the present cutting every precaution is taken to lessen this risk. The brush from the tops of the trees is being piled, and later, when the ground is wet or covered with snow, the piles are burned under the direction of a forest officer. With lodgepole pine this brush burning is also an aid in securing seedlings, for little trees are best started on an area where the mineral soil is exposed. Complete disposal of the brush leaves nothing on which a forest fire may gain headway, and, safe from this greatest danger, the forest is left to supply wood for the future and to regulate the flow of the streams which drain it, and meanwhile, the great mining industry of Butte is securing the timber it must have if it is to continue.

* * *

Production of Precious Stones in the United States

THE total value of the precious stones produced in the United States during 1907 is placed by the Geological Survey at $471,300, as compared with $208,000 in 1906. This great increase is due chiefly to a very large output of sapphire in Montana, of both the blue and the variegated variety. The total production of sapphire in the United States for 1907 is estimated at $229,800. Tourmaline is second in importance, and is placed at $84,120. Among other important gems produced were chrysoprase, to the value of $45,500; californite, $25,000; turquoise, $23,840; spodumene gems (kunzite and hiddenite), $14,500; varicite, utahlite, and amatrice, $7,500; rose quartz, beryl, and aquamarine, and garnet, each over $6,000.

A new gem mineral—benitoite—has been added to the list of known precious stones. This is a titanosilicate of barium, having a blue color and a high refractive index. It is found in San Benito County, California. The reopening of the emerald-hiddenite mine in Alexander County, North Carolina, during 1907, is of interest since the supply of hiddenite for jewelry has become very low.

* * *

Body of Slain Forester Recovered

A CABLE from Manila to the Bureau of Insular Affairs states that the bodies of H. D. Everett and T. R. Wakeley have been found and are being brought to Manila for burial. This

report confirms the rumor which reached the United States the latter part of June to the effect that Everett and Wakeley, together with four Filipinos, had been murdered by natives while crossing the Island of Negros. The party had been missing for six weeks at the time the report was received of the assassination.

H. D. EVERETT

Mr. Wakeley was a native of Chicago and was acting as Superintendent of the native schools in the Island of Negros. Everett was a graduate of the literary department of Cornell University and of the forestry department of the University of Michigan. He entered the Forest Service in 1904 and was engaged in various lines of forest work throughout the United States during the succeeding two years, when, at his own request, he was transferred to the Philippine Bureau of Forestry. Here he received rapid promotion until he became assistant director of the Philippine Bureau of Forestry. The three years which he had contracted to remain in the Philippines had nearly expired and he had just decided to remain with the work another year just before starting for Negros. As part of his official duties, Everett had charge of forestry matters in five islands of the Philippine group, including the Islands of Panay, Negros, Cebu, and Bobol. The party consisting of Everett, Wakeley, and the four Filipinos were engaged in surveying and mapping the Island of Negros and in making an investigation of its natural resources. As soon as the report of the murder of the party reached Manila, Capt. George P. Ahern, Director of the Philippine Bureau of Forestry, started out with a party to make an investigation. The cable just received by the Bureau of Insular Affairs states the result of Captain Ahern's trip.

Everett was a man of unusual ability and his death will be a serious blow to the cause of forestry in the Philippines. He is the son of O. M. Everett, of Malone, N. Y., and was born in 1880.

Declares for Government Regulation

THE Delta County, Colo., Republican convention in its platform declares for "Government regulation as against Government ownership. Liberal appropriations for the improvement of waterways and harbors, under a general plan that shall be comprehensive and just to all portions of the country, the conservation of our natural resources by a proper and effective regulation of their use; liberal provisions to continue the work of reclaiming arid agricultural lands of the West."

THE VALUE OF NATURAL SCENERY

By J. HORACE MacFARLAND, President American Civic Association

Address Delivered at the White House Conference, May 14, 1908

I URGE this august and influential assembly to consider the essential value of one of America's greatest resources—her unmatched natural scenery.

It is well that we should here take full account of the peril to our national prosperity, indeed to our very national existence, which lies in further wasteful disregard of our waning resources of forest and mine, of water and soil. By the possibilities of conservation here discussed, the mind is quickened, the imagination fired. But the glory of the United States must rest and has rested upon a firmer foundation than that of her purely material resources. It is the love of country that has lighted and that keeps glowing the holy fire of patriotism. And this love is excited, primarily, by the beauty of the country. Truly inspired is our national hymn as it sings—

> "My native country, thee,
> Land of the noble, free,
> Thy name I love;
> I love thy rocks and rills,
> Thy woods and templed hills:
> My heart with rapture thrills
> Like that above."

Paraphrasing a recent utterance of Mayor McClellan upon city beauty, I insist that

> "The country healthy, the country wealthy, and the country wise may excite satisfaction, complaisance and pride, but it is the country beautiful that compels and retains the love of its citizens."

We cannot destroy the scenery of our broad land, but we can utterly change its beneficial relation to our lives, and remove its stirring effect upon our love of country. We can continue to convert the fairest land the sun shines upon into a desert of ugliness. Indeed, we are abundantly able to outdo the Sahara itself in desolation, for that vast waste, so singularly like the United States in contour and extent, and once, geologists insist, as well wooded and watered as was our favored land a century ago, has somber dignity in its barrenness—a dignity completely absent from our civilized Saharas of culmbank and ore-dump, from timber slashing and filth-filled river.

Scenery of some sort will endure as long as sight remains. It is for us to decide whether we shall permanently retain as a valuable national asset any considerable portion of the natural scenery which is so beneficently influential upon our lives, or whether we shall continue to substitute for it the unnatural scenery of man's careless waste. Shall we gaze upon the smiling beauty of our island-dotted rivers, or look in disgust upon great open sewers, lined with careless commercial filth, and alternating between disastrous flood and painful drought? Are we to consider and hold by design the orderly beauty of the countryside, or permit unthinking commercialism to make it a horror of unnecessary disorder? Is the Grand Canyon of the Colorado to be really held as nature's great temple of scenic color, or must we see that temple punctuated and profaned by trolley poles? Shall we hold inviolate all the glories of the Yosemite, or are we to permit insidious corporate attacks upon its beauty under the guise of questionable economics? Shall the White Mountains be for us a great natural sanitarium, or shall they stand as a greater monument to our folly and neglect?

It is certain that there has been but scant thought given to scenic preservation hitherto. I remember the contempt with which a lawyer of national renown alluded to the absurdity of any legislation by Congress in preservation of scenery, when, in its wisdom, that body chose to give a measure of temporary protection to a part of Niagara's flood.

Indeed, one of the potent forces of obstruction to the legislation now demanded by the country in scant protection to the almost destroyed mountain forests of the East has expressed itself in a contemptuous sneer at national expenditures for the preservation of scenery!

We meet in a historic place, in a historic city. The Father of our Country was not only greatest in war and in statesmanship, but one of the greatest of his time in esteem of natural beauty, and in the desire to create urban beauty in what he wisely planned as the Federal City. George Washington loved dignified beauty, and the wisdom of his plan has resulted in making a national capital not only admirable in its adaptation to the public needs, but destined, as his plans are carried out, to be beautiful beyond compare.

What is the effect of the scenic beauty of Washington upon the citizens of the nation who come here? Is not their pride awakened, their patriotism quickened, their love of country increased by the dignity of man's effort for beauty here? Consider wealthy Pittsburg, busy Cincinnati, proud Chicago, with their wasteful smoke, their formless streets, their all-pervading billboards and grime—would one of these serve to stimulate love of country as the national capital?

No, the unthinking and ofttimes unnecessary ugliness of civilization does not foster patriotism, nor does it promote the health and happiness which are at the very basis of good citizenship. When, in looking over the horrors of industrial civilization, William Morris urged humanitarian effort

> "Until the contrast is less disgraceful between the fields where the beasts live and the streets where men live,"

he brought out a bitter truth. We have made our cities ugly, for the most part; but we are learning the basis of happy citizenship, and, while we cannot altogether make over these centers of population, we are bringing into them the scenic suggestion as well as the physical facilities of the open country, in the parks. In these parks lies the answer to the ignorant contempt for scenery to which I have alluded; for it is incontrovertible that peace and health and good order are best fostered in the parks including the most natural scenic beauties.

Mr. Chairman, there is, too, a vast economic reason for jealously guarding all of our scenic heritages in America. Visiting a quiet Canadian community on the shore of Lake Ontario a few days since, I was impressed by the number and the beauty of the summer homes there existing. Inquiry brought out the astonishing fact that they were almost exclusively owned by residents of a certain very wealthy and certainly very ugly American city, where iron is king. The iron manufacturers flee from the all-pervading ugliness they have created, and the money earned in complete disregard of the naturally fine scenic conditions about their own homes is used in buying scenic beauty in a foreign country. Perhaps a certain form of protection is here suggested!

It is authoritatively stated that the tourist travel tribute paid annually to Europe exceeds a half-billion dollars, of which vast sum America contributes a full half, getting back a far smaller sum in return travel from all the world. No one will suggest that there is travel to see ugly things, or to look upon wasted scenery, in Europe. No, this vast sum is expended almost entirely in travel to view agreeable scenic conditions, either natural or urban. The lumber king leaves the hills he has denuded into piteous ugliness, and takes his family to view the jealously guarded and economically beautiful Black Forest of Germany. The coal operator who has made a horror of a whole country, and who is responsible for the dreadful kennels among the culm-banks in which his imported labor lives, travels with his gains to beautiful France, and he may motor through the humble but sightly European villages from whence came his last invoice of workers.

Every instinct for permanent business prosperity should impel us not only to save in their natural beauty all our important scenic possessions, but, also, to fully safeguard the great and revolutionary development almost certain to follow this epoch-making conference. We are assured by experience that the use of our great renewable resources of soil fertility is attended with the continuance of beautiful scenic conditions. The smiling farm, the blooming and glowing orchard, the waving wheat-fields, the rustle of the corn—all these spell peaceful beauty as well as national wealth which we can indefinitely continue and increase.

Can we not see to it that the further use of our unrenewable resources of minerals and primeval forest is no longer attended with a sad change of beautiful, restful, and truly valuable scenery into the blasted hillside and painful ore-dump, ugly, disturbing and valueless?

The waters of our streams must furnish the "white coal" of the future, and electrically turn the wheels of commerce in smokeless economy. Such a change can consider, retain, and sometimes increase the beauty of the scenery; or it can introduce the sacrilegious ugliness of which the American gorge at Niagara is at present so disgraceful an example. The banks of the waterways we are to develop can be made so pleasing as to attract travel, rather than repel it, if we care for this land of ours as a place to dwell in, rather than to flee from.

We cannot, either, safely overlook the necessity for retaining not only for ourselves, but for our children's children, at least a portion of God's glory of mountain and vale, lake, forest, and seaside. His refuge in the very bosom of nature, to which we may flee from the noise and strain of the market-place, for that renewing of spirit and strength which cannot be had elsewhere. True, we can continue and expand our travel tribute to the better sense of the Eastern World, but that will not avail our toiling millions. "Beauty for the few, no more than freedom or education for the few," urges William Morris, and who shall say that such natural beauty of scenery as we have is not the heritage of all, and a plain necessity for good citizenship?

Every one of us recognizes the renewing of strength and spirit that comes from even a temporary sojourn amidst natural scenic delights. The President has but just returned

from a "week-end" visit to his castle of rest in the Virginia hills. Could he have had equal pleasure in Hoboken? Mr. Carnegie's enterprises built dreadful Homestead, but he finds the scenery about Skibo Castle much more restful!

Who of us, tired with the pressure of twentieth century life, fails to take refuge amid scenes of natural beauty, rather than to endeavor to find that needed rest in a coal-mining village, or in the heart of some sordidly ugly timber slashing? The most blatant economist, who sneers at the thought of public beauty, accessible by right to all, is usually much interested in private beauty of scenery, of home and of person if accessible to him alone! Selfishly and inconsistently he recognizes in his own use the value of the natural resources he affects to despise.

I am convinced that the vast majority of my countrymen hold deep in their hearts sentiments of regard for the glorious natural beauty of America. If to my inadequate words there be any response among those here present, may I but hint at some things that might well result?

First, we must hold inviolate our greater scenic heritages. All the nations visit the Falls of Niagara as the wonder of the Western World, yet we are even now engaged in an attempt to see how closely we can pare its glories without complete destruction. Eminent authorities warn us that the danger line is passed, and that recurrence of a cycle of low water in the Great Lakes may completely extinguish the American Fall. A hundred other water powers in New York and Ontario would together give as much wheel-turning electric energy, but all the world cannot furnish forth the equivalent of Niagara in beneficent influence upon the minds of men, if held as a scenic heritage. The glory of Niagara to-day hangs by a hair, and millions of incorporated private money seek covetously to cut the hair.

The National Parks—all too few in number and extent—ought to be held absolutely inviolate, as intended by Congress. Intrusions for questionable water-supply needs, against the unselfish protests of those whose love of country cannot be impugned, should not be permitted.

The scenic value of all the national domain yet remaining should be jealously guarded as a distinctly important natural resource, and not as a mere incidental increment. In giving access for wise economic purposes to forest and range, to valley and stream, the Federal government should not for a moment overlook the safeguarding to the people of all the natural beauty now existing. That this may be done without in any way preventing legitimate use of all the other natural resources is certain.

The Governors of sovereign states here assembled, the many organizations here represented, possess the power and have the opportunity to so change and guide legislation and public opinion as to foster the underlying desire for public beauty, both natural and urban. We have for a century stood actually, if not ostensibly, for an uglier America; let us here and now resolve, for every patriotic and economic reason, to stand openly and solidly for a more beautiful, and, therefore, a more prosperous America!

CONSERVATION OF POWER RESOURCES

By H. ST. CLAIR PUTNAM, LL.B., E.E., Member A. I. E. E.
Consulting Electrical Engineer (New York)

Address Delivered at the White House Conference, May 14, 1908

WITHOUT disparaging other aspects of our progress, it is not too much to say that our time is preeminently the Age of Power. This applies to the world at large, but especially to the United States. Our population is increasing with unprecedented rapidity, but our mineral production is increasing so much more rapidly that this is not inaptly styled "the Age of Metal." Steel, copper, and wood are combined in mechanical devices at a rate increasing so much more rapidly than ore production that we may be said to live in the Age of the Machine; yet that aspect of modern life which most impresses the student of development is the increasing use of mechanical power through the development of prime motors and the utilization of new power sources. Rapidly as our population advances, it is outrun by metal production, and that in turn by machine building; yet our most rapid progress —the feature in which our advancement exceeds all others—is in the development and use of Power.

Historically considered, the utilization of our power resources has undergone three characteristic phases of development.

In the first, power was produced directly by natural resources such as falling water and wind, and its use necessarily was limited to those places where these natural forces were found. This led to the early

growth of industrial communities in such favored localities as is illustrated by the prosperity of the early manufacturing establishments of New England, grouped about easily available water powers, and in this country it held ascendency in the manufacturing industries until about 1870.

The second phase was characterized by the development of the steam engine which rendered practicable the utilization of the stored energy in fuel as a source of power. During this period the development of coal mines and rapid growth of our railway systems imparted a tremendous stimulus to commercial enterprises. Proximity of water powers was no longer controlling, and factories were established at points selected by reason of the availability of raw material, labor, transportation facilities, and markets, as well as power supply. As in the first period, however, the power necessarily was used where developed and the size of the plant was limited to the requirements of the individual user.

Electrical transmission of power is the new art which now is resulting in another and radical change in methods of utilizing our power resources, permitting, as it does, development whether by water power or by steam at points most convenient and economical and transmission to the consumer in form adapted to great variety and conveniece and use. This new development in applied science calls for reappraisement of the sources from which our power is derived. The size of the power plant is no longer limited to the requirements of the individual user, but the power for entire communities can be supplied from a single station. The enlargement of this field of work newly opened by the electric transmission of power from great distances is now in active and practical development. As a result rapid changes are taking place in the methods of using power. New economics are possible of accomplishment and the resulting effect upon the conservation and utilization of our power resources is of the greatest importance.

Where power is developed from the combustion of coal, wood, oil or gas, our natural resources as such are destroyed and they cannot be replaced, excepting to a limited extent in the case of wood and similar products. The supply of natural oil and gas is limited and uncertain and the amount available is required for special industries. The coal production of the United States for the year 1906 was 414,157,278 tons; for 1907, about four hundred fifty million tons. If the production of anthracite coal is continued at only its present annual rate the supply will be exhausted in sixty to seventy years. Since the beginning of our coal industry the production has doubled approximately every ten years. Assuming that this rate of increase cannot be maintained, but will become constant in about one hundred fifty years, it is estimated that the supply of bituminous coal will be exhausted in approximately seven hundred years. But that the coal production should become constant even one hundred fifty years hence, implies that our industries must become stationary, unless other power resources are found. We cannot look forward to such a condition with equanimity. Without coal our domestic and industrial life are inconceivable, and our existence in great cities and crowded communities is impossible unless a substitute is devised. The future welfare of the nation requires that all practicable means be employed for the conservation of the supply of coal.

Where power is derived from water, winds, and tides, only energy otherwise wasted is used. The energy thus extracted is added to our assets instead of being a permanent loss as is the case with the combustion of coal. It is now feasible and practicable to develop water powers, wherever located, for electric power. In the aggregate the available water powers of the nation greatly exceed the present power requirements, but unless there is some curtailment in the rate of our development, our water power resources, while being of great magnitude, will not of themselves solve the problem of our future supply of power. The amount of water power available in the United States is not known. Some partial estimates have been made, but these are necessarily approximate, as exact figures can be obtained only after careful survey and study not only of the existing physical conditions, water flow, and available reservoir capacity, but of the practicable auxiliary steam power that can be profitably installed. The power of Niagara Falls has been estimated, by Prof. W. C. Unwin, at seven million horsepower. A partial estimate of the water powers of the upper Mississippi River and tributaries places the available water power at about two million horsepower. The southern Appalachian regions can furnish a minimum of nearly three million horsepower. Both of these estimates can be greatly increased by including the use of regulation reservoirs and auxiliary steam plants. The water powers of New England are more fully developed than elsewhere in the country, though much remains yet to be done. In the Rocky Mountains and the far West there are immense water power possibilities; in the State of Washington alone there are three million horsepower available. Even approximate data upon which to base an estimate of the total amount of available water power in the country is lacking, though a good start in its collection has been made by the War Department and the Geological Survey with the limited means at their disposal. It is probable that the water power in the United States exceeds thirty million horsepower, and under certain assumptions as to storage reservoirs this amount can be increased to 150,000,000 horsepower or possibly more. Much depends upon whether regulation res-

ervoirs and reserve steam plants are included in the estimate. Both have been demonstrated to be practicable and undoubtedly should be considered in any estimate made of the available water power resources of the country.

Using the smaller figure of thirty million horsepower as an illustration, to develop an equal amount of energy in our most modern steam-electric plants, would require the burning of nearly 225,000,000 tons of coal per annum, and in the average steam engine plant, as now existing, more than six hundred million tons of coal, or fifty per cent. in excess of the total production of the country in 1906. At an average price of $3 per ton it would require the consumption of coal costing $1,800,000,000 to produce an equivalent power in steam plants of the present type.

The supply of water power is limited, however, when the rapid rate of increase in our power requirements is considered, and great care, therefore, must be exercised to insure the preservation of our water power resources and to secure the maximum practical development.

Using the data furnished by the census returns of 1900, 1902, and 1905 as a basis, and applying the prevailing rate of increase in the industries included in these reports, and adding an equivalent amount for the steam railroads, it is estimated that the total installed capacity of prime movers in all our land industries for the year 1908 approximates thirty million horsepower.

The average load on steam and other engines is much less than their rated capacity, and, owing to the overlapping of loads, it is probable that the total average load does not exceed one-third or one-quarter of this amount.

During the past thirty years the total amount of power used in our manufactories and other industries, as recorded by the census, has doubled approximately every ten years. The fact that substantially the same rate of increase has existed in coal production, railroad gross earnings, freight tonmileage, passenger mileage and the value of agricultural products as well as in total power consumption, is a striking demonstration of the close inter-relation and mutual dependence of these great factors which, in the aggregate, measure the industrial progress of the nation. Yet the records of power used in small units are far from complete.

We cannot foretell how long the present rate of increase in our industrial enterprises will continue. This will be determined by the general laws which govern industrial development and by the increase in wealth. It is clear, however, that if our power resources are exhausted or wasted, the result will be disastrous.

Of the total estimated power at present produced by prime movers, about twenty-six million horsepower is produced by steam engines, three million horsepower by water motors, and seven hundred thousand horsepower by gas and oil engines. These figures emphasize the present position of the steam engine in our industrial development, and the relatively much less important place now occupied by water power.

Of the total thirty million horsepower, including the railroads, used in the country, it is estimated that nine million horsepower, or thirty per cent., is now utilized electrically. This remarkable growth has been accomplished in twenty-five years. The use of electric power at the present time is being doubled approximately every five years, as contrasted with the phenomenal doubling of the total power every ten years. If the present rate of increase is maintained, electrically applied power will equal or exceed the power mechanically applied in 1920. This great growth is due to the convenience, earning capacity, and economy resulting from the use of electrically applied power. The significance of this remarkable increase in the use of electric power in manufacturies and other industries lies in the market thus provided for the utilization of our water powers, wherever located and whatever their magnitude.

Where coal is the source of power, electric transmission and distribution greatly reduce the amount burned to perform given mechanical work. This results from the substitution of a few large and highly efficient boilers and engines for a larger number of relatively small and uneconomical ones and from the introduction of plant economies and skill in operation not attainable in the smaller plants. A material saving is effected also in the application of the power directly to the work through motors instead of indirectly through inefficient countershafting and belting.

A further material gain also results from the fact that a large plant carrying the load formerly carried, for example, by one hundred small plants is operated under conditions more nearly approximating uniformity of load, and therefore at higher economy.

Greater economy can be obtained, even in our large plants, through the more general use of so-called fuel economizers, superheated steam, higher vacuum, and better combustion under the boilers. We may expect still higher efficiency from the development of larger boiler and engine units. These economizing appliances, which are relatively unimportant in small plants, become of great importance in large plants, and will have still greater influence on steam practice as the price of fuel increases and the cost of capital decreases.

This discussion would be incomplete without mention of the great possible fuel economy that may result from the use of gas and other similar engines. Though engines of this character ante-date the use of the electric motor their development has been slow, and they occupy a relatively unimportant place as power producers. The

ordinary steam engine utilizes not more than four or five per cent. of the heat energy in coal, and our best modern steam electric plants show a heat efficiency not exceeding ten or twelve per cent. With the gas engine and producer gas the heat efficiency can be more than doubled, and still higher efficiency seems probable with higher compression or through the use of other possible improvements. This is a most promising field for development, and it is entirely possible that the gas engine may revolutionize our methods of using fuel for the production of power.

Beyond these gains, which may be considered well within the limits of possible attainment by present knowledge, there stands the theoretical prospect of still greater economies, the possibility of which cannot be denied so long as methods employed in developing energy from coal results in a waste of from seventy-five to ninety-five per cent. of the potential energy which nature has stored in the coal. But the science of the present time does not permit us to assume any radical increase in efficiency of fuel engines beyond the limits which I have indicated and our only safe course is to base our estimate upon the progress of the present time with such reasonable allowance for improved economy as is dictated by recognition of progress of the art along lines now within the horizon of possible science.

Where the water power is the source of supply, electricity promotes economy for reasons identical with the foregoing, except that absence of fluctuation of load is relatively less important, but the great gain which results from electric transmission is the utilization of water powers remote from power markets. Where several water powers along a stream are developed it becomes possible to utilize, in conjunction with the larger and more cheaply developed powers, others which, considered independently, could not be utilized to advantage.

Prior to 1870 the use of water power in manufactures exceeded that of steam power. Water power expressed in percentage of the total power employed has since steadily declined, falling from 48.3 per cent. in 1870 to 11.2 per cent. in 1905. During the corresponding period steam power increased from 51.8 per cent. in 1870 to 78.2 per cent. in 1900. The census of 1900 showed a marked falling off in the rate of increase in the percentage of steam power used as compared with the rate prior to 1890, and this was accentuated in the census of 1905, when the percentage of steam power fell to 73.6 per cent. of the total. This check to the ascendency of directly applied steam power was due to the introduction of electric power. In 1890 electric power was negligible. In 1900 it constituted 4.8 per cent. of the total. In 1905 this had increased to 11.8 per cent.—a marvelously rapid growth when the aggregate increase of over one million horsepower in five years is considered. If the present rate of increase prevails until 1910 electric power will have reached eighteen per cent. of the total and steam power will have dropped to sixty-eight per cent. If the same rate of increase is maintained until 1930, electric power as applied to the manufacturing industries will exceed the amount of steam power applied direct.

The tendencies illustrated by the changes that have taken place in the methods of utilizing power in manufacturing, apply generally to other industries. The increasing use of power is phenomenal; the steam engine as a source of power is thus far paramount in them all, but the percentage of electrically applied power is increasing at nearly double the rate of increase of the total power used.

The extraordinary growth of the electric lighting industry is familiar to all. Unfortunately the results of the special census of 1907 are not yet available, but the indications are that the five years that have elapsed since the previous census will show phenomenal growth. During these five years the gross sales of the great electric manufacturing companies have doubled, and the proportion of the output consisting of electric power apparatus and generating units of large size has greatly increased. An influential factor in the growth during this period has been the rapid development of long distance hydro-electric power transmission plants.

Since the displacement of horse and cable cars in the cities a few years ago, electric railways have been extended to suburban and interurban districts and are rapidly forming a network over the entire thickly settled portions of the country. In the nature of their traffic many of these roads are scarcely distinguishable from steam railroads, and many railroads are using them as feeders. In a few cases railroads have converted steam operated branches into electric lines.

A beginning is being made in the electrification of our steam railroads. The New York Central, the Pennsylvania, the Long Island, the New York, New Haven & Hartford, the Grand Trunk, the Northern Pacific, the Erie, the Southern Pacific and others have electrified portions of their lines, and most of these are now in successful operation. Many of these roads are extending the electric zone. Thus far most of this work has been induced by terminal requirements, tunnels, heavy grades or other special conditions which emphasize the advantages to be derived from electric operation. The increase in capacity, convenience, and greater earning power as well as the economies resulting from electric operation will stimulate the electrification of steam railroads, just as these factors have stimulated the use of electric power in other industries. The problem presented is larger because of the necessity of interchangeability of equipment, and the development must necessarily be gradual on account of the magnitude of the interests and the large capital expenditures involved. The

railroads are among the largest consumers of fuel, and electric operation, exclusive of the use of water powers, would reduce the coal consumption to less than one-half of that required for similar operation with steam locomotives.

During the past few years, there has been renewed interest in water powers on account of the practicability of their use for the generation of power and the electrical transmission of this power to distant markets. The great hydro-electric development at Niagara was the first large enterprise of this character and has demonstrated its practicability. The census of 1905 gives a partial list of long distance hydro-electric plants developing power aggregating six hundred horsepower, and this list can now be largely increased. Our most desirable water powers are being absorbed rapidly, and it becomes important, therefore, for us to take stock of our water resources and formulate plans for their control and proper utilization.

In the improvements that have been made on navigable rivers too little attention has been given to the development of the incidental water powers. On some waterways, as in several instances on the Mississippi, immense sums of money have been appropriated and expended on especially difficult portions of the river. If this money could have been available in large amounts, instead of by driblets over periods of many years, water powers of great value could have been developed and the navigation effectively and permanently improved. Unfortunately this has not been our policy. Too often the appropriations have been inadequate for carrying out the work as it should be done, and frequently the work has not followed any well-digested plan.

With the data at hand it is impossible to make an accurate estimate of the amount of power that can be developed incidentally to river navigation. A partial estimate of the power developed at existing Government locks and dams places the amount at 1,600,000 horsepower. This is based on the mean low water discharge for three months. The subject should receive careful consideration. Improvements in navigation should be made only after thorough study of the possibilities of power development. On the other hand, many water powers are on streams that are navigable, or are capable of canalization, and these streams should be developed for power purposes only after careful examination has been made of the possibilities of the stream forming a link in the system of inland waterways.

There are many streams that are not now navigable, or are navigable for only a portion of the season, that can be canalized and converted into streams of great commercial value. The use of our waterways for both power development and navigation causes no conflict; these uses are in fact co-related and their interests harmonious. Where it is necessary to place a dam across a stream to develop power, the slack water so produced, with the addition of locks, renders otherwise impassable stretches of river available for navigation. Every water power development is vitally interested in obtaining a uniform flow of water. This exactly meets the requirements of navigation. The approximate realization of regularity of flow can be attained only by the construction of head-water regulating reservoirs and the preservation of our forests. Every water course that is improved for the production of power and for navigation produces, therefore, vigorous self-interested allies in the cause of forest preservation, head-water regulation and the maintenance of conditions which are favorable to both interests.

Considerations which affect the use of our rivers and streams, as sources of power and for navigation, apply also to canals. Heretofore, canals built for transportation purposes have not been used, to any great extent, for the development of power. In some cases this has been on account of the limited supply of water, but more frequently it has been due to the great difficulty experienced by the animals in towing boats against the rapid current produced in the canal by the flow of water to the water wheels. In recent tests it has been demonstrated that canal boats can be towed by electric towing machines at a much lower operating cost than is possible with animals and that operated in this manner the speed can be greatly increased. The first cost of electric equipment is relatively large, but the change to electric towing will pay handsomely when the volume of traffic is sufficiently large. The traffic required is well within the ultimate capacity of the canal. With electric towing the increase in the rate of current flow introduced by the development of water power on the canal is not a serious impediment to navigation.

There are large areas in the Western States where the soil is of wonderful fertility, but irrigation is essential to the successful growing of crops. The cultivated lands usually lie in valleys and water is carried to them through long and oftentimes wasteful irrigation ditches. In many cases the water could be utilized for developing power on the headwaters of the streams without injury to the irrigation interests, as is illustrated by the excellent work now being done by the Reclamation Service. The development of water power will introduce another party whose self-interests dictates the use of every available method of preserving the volume of water supply, its continuity, and regularity of flow.

In some cases irrigation channels can be converted into canals suitable for at least limited navigation, and where practicable this should be done. Some types of apparatus as now developed for towing canal boats by electricity require but little space along the side of the ditch and can be installed, usually, without additional grading wherever an irrigation ditch can be constructed. Electric tow-

ing cannot be economically practicable, however, unless the traffic reaches a considerable volume. With animal power the additional capital investment is small and is proportional to the amount of business handled. With electric towing the first cost is large and manifestly sufficient traffic must be secured to meet the capital charges before profits can be realized.

What has been said upon the subject of irrigation canals applies to the development of the water supplies for our cities. This work, like irrigation, should be carried out so as to develop the maximum water power possible without injury to the water supply.

The preservation of the purity of water for domestic use is of great importance to the welfare of the nation. A consideration of this subject, as well as of navigable waterways, canals, irrigation and water powers, emphasizes the absolute necessity of competent supervision of the natural water resources of the country.

The flow of water in many streams annually fluctuates between wide limits. The low water periods limit the profitable water power development and the high water periods often cause disastrous floods. On most streams the average rate of flow for the year is many times the minimum flow. It is possible in some cases to utilize a flow approximating the average by constructing controlling reservoirs on the headwaters of the stream. Our Great Lakes form a natural reservoir of this character for the Niagara River. The Upper Mississippi has great natural reservoirs, which assist in regulating its flow and which easily can be made very effective in its control. The notable floods of the Ohio River can be greatly reduced by the construction of controlling reservoirs on its headwaters, which will result in the saving of millions of dollars now annually destroyed. On a stream which I recently investigated the minimum flow furnishes but two hundred horsepower. The construction of a storage reservoir increases the continuous twenty-four hour power that can be utilized to eight thousand horsepower. If storage reservoirs could be constructed on the Susquehanna River, upon which a great water power development is now in course of construction, so as to obtain a uniform flow throughout the year, the available power at this site would be increased from a minimum of 30,000 horsepower to 200,000 horsepower. While it is impracticable to construct reservoirs capable of holding back all flood waters it is nevertheless certain that material gain would result from well-directed efforts along the lines suggested.

On account of the great annual fluctuations now existing in stream flow it has been found profitable to install steam plants supplementing the water power during seasons of low water. This method, on account of its expense, greatly handicaps the full development of our water powers and increases the amount that must be charged for the power. Under given conditions the most profitable amount of water power to develop and the best size of steam plant to install can be determined with great accuracy. The reserve steam station need not be located at the water power; in fact, it preferably should be located at or near the market for the power when that is distant, as greater reliability and continuity of power supply is thus secured. Headwater regulation would greatly reduce the necessity for such auxiliary steam plants.

Similarly the water power which can be purchased economically by a prospective customer who already has a steam plant in operation can be accurately determined. This amount depends upon the relative cost of generating different portions of the load by steam as compared with the amount charged for the water power supplied. In its economical application this method of operation works out so that the water power plant carries the steady portion of the load where the coal consumption per horsepower capacity is greatest, and the steam plant is called upon to carry the peaks only where the coal consumption per horsepower is least.

In addition to their reserve function in time of low water or flood auxiliary steam plants and inter-connected plants are valuable as insuring the continuity of power supply. If the lines are run overhead, as they must be for long distance transmission in the present development of the art, all electric transmission plants are subject to occasional short interruptions due to storm, lightning or malicious mischief. It is economical and desirable to tie together two or more plants, thus greatly increasing the reliability of service. If one plant or transmission line fails the others can be pushed to take the load. From an engineering standpoint, and from the standpoint of the engineer as well as the power producer, this method of operation has great advantages.

In 1905 the value of the product of our manufactures amounted to $16,866,706,985; the total receipts of the steam railroads were $2,325,765,167.

In manufacturing the value of the product was $1,152 for each horsepower installed and the yearly wages amounted to $248 per horsepower.

In the railroad industry the gross receipts amounted to $555, and the yearly wages to $224 per horsepower, rated on a basis comparable to that used in the census report covering manufactures.

I have selected these two classes of industry for the reason that they use the bulk of the power and illustrate its tremendous productiveness in increasing our wealth.

These figures emphasize the vast financial importance of our power resources and the necessity of their conservation and their intelligent development. Much can be accomplished by the National Government in connection with irrigation of national lands and

the improvement and preservation of navigable waters. The state governments can greatly assist in this work, within their respective territories.

A reliable census of water resources is greatly needed. The Geological Survey has accomplished much in measuring and recording the flow of streams, but the work done is small as compared with that which remains to be done. Obviously in order that records of this character shall constitute a uniform and safe basis for the very large capital investment which must be made in the future, in order that our water power resources shall be properly utilized and our fuel supplies conserved, they should be made under the immediate direction of the National Government.

The National Government can render great assistance also in the research work which it has undertaken into the better utilization of our fuels. Excellent results have been obtained by the able corps of engineers engaged on this work, but when we consider that we are now utilizing but five or ten per cent. of the heat value in fuels it is evident that much remains to be done.

Power and transportation are the two great physical bases upon which modern industrial development rests. Without power our methods of transportation must revert to a level with those existing in China. Up to the present time, while Nation and state have regulated, and in some degree aided, in the development of transportation, the power resources of the country have been utilized or wasted by the private individual and the corporation with little hindrance, and still less assistance from the constituted authorities. Next to individual enterprise the most essential factor in the development of our national resources is wise governmental regulation so applied as to insure the vigorous working of individual initiative and at the same time prevent the waste by individuals of that which is vital to our national welfare and to secure in the utilization of our natural resources the highest practicable degree of economy which scientific knowledge and engineering skill can attain.

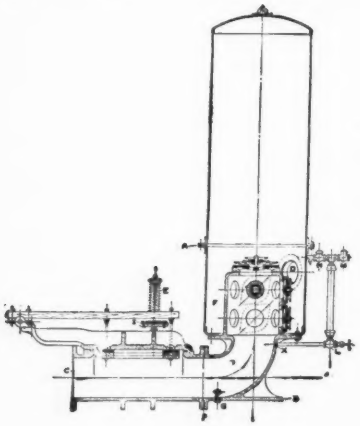
THE WATER-SUPPLY PROBLEM

Its Solution Found in the Increasing Use of Hydraulic Rams and Similar Engines

ELEVATING and conveying water most economically, efficiently, and under all weather conditions, have, from ages back, been the study of those whose purpose is to solve the problems of supplying man's commodities. One of the most perplexing problems of those isolated from public water, wells, springs, or natural reservoirs, is how and by what simple and practical manner they may obtain an efficient water supply suitable for all necessary requirements.

Irrigation has within recent years, turned arid prairies into fertile fields. The enterprising, hard-working farmer need no longer depend on the mercy of the weather to bring rain to his crops. He can, by his own ingenuity, supply his fields with water. It is possible for him to irrigate his lands not only by natural gravity, with streams from reservoirs, but, also, by elevating the water to fields above the source of supply. This can be accomplished with hydraulic rams, which are made in sizes sufficiently large to supply the ordinary demand in such cases. Among the pumps extensively used for these purposes are the Rife Automatic Hydraulic Rams, as well as other similar engines, all of which are being used for lifting water above the source of supply. Such a ram is a modern develop-

ment of its ancestor—an old-fashioned type—and is of such ingenious construction that it gives the maximum amount of water from the source of supply. Being a machine of many



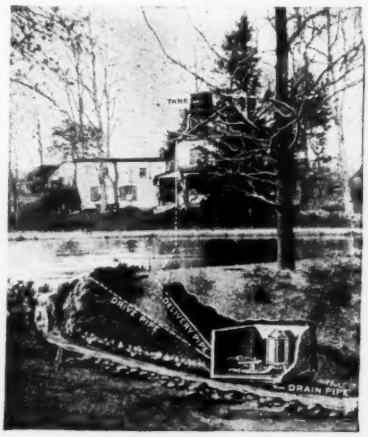
sizes it meets all requirements. It can convey to the housewife what water she needs from a spring any distance from the house; it can supply a whole town with all the water it needs; or it can serve as the agent of conveying to a dry and barren field all the water necessary to irrigate the tract. Such a machine, when once placed to work by falling water—only a fall of two feet is sufficient to convey a stream any distance at an altitude of sixty feet—will run without any further attention day and night, year in and year out, never freezing, never wearing out, and never in need of oiling.

These rams are simplicity itself and combine the most perfect application of hydraulics known to science. There is nothing to break and nothing to get out of order, and they always deliver an abundant and reliable stream.

A hand pump is out of the question for any amount of work, and a windmill runs only in a breeze, and it is worn and subject to repairs, needs oiling, etc. A gasolene engine requires attention, needs fuel and is more expensive. None of these troubles enter into the running of a hydraulic ram, the expense of which operation is *nil*.

This kind of hydraulic ram makes it possible for a number of towns and cities to install a system of waterworks, whereas, under certain conditions, they would have none. All municipalities cannot afford to incur an annual expense of from $1,500 to $5,000 for operating a steam plant to run a waterworks, but it becomes very easy for them to lay out about $10 a year for minor repairs where a hydraulic ram is doing the work. Numerous towns throughout the United States and Canada are using such rams to supply their reservoirs and stand-pipes with water. Fire protection is a most urgent necessity, and, where natural conditions justify it, it is hard to understand how any town can well afford to be without a system of waterworks where the engine in question does the work.

As evidence of the merit found in these machines, it may be stated that the United States Government has adopted some at various points, both for



supplying tanks used for fire protection and others for water supply.

The Rife rams which have now been on the market for nearly fifteen years, are used extensively here and abroad, many having found their way to fields of irrigation in South America, South Africa, and the Hawaiian Islands. The Government operates a number in the Philippine Islands.